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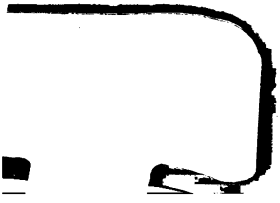

*Publications of the National Bureau of Economic Research, Incorporated.*

No. 1.

# INCOME IN THE UNITED STATES
# ITS AMOUNT AND DISTRIBUTION
# 1909-1919

# INCOME IN THE UNITED STATES

## Its Amount and Distribution

## 1909-1919

BY

THE STAFF OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH, INCORPORATED

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SUMMARY

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# PREFATORY NOTE

The National Bureau of Economic Research, Incorporated, was chartered in 1920 to conduct quantitative investigations into subjects that affect public welfare. Its aim is to ascertain fundamental facts within its field as accurately as may be, and to make its findings widely known. By so doing, the Bureau hopes to aid all thoughtful men, however divergent their views of public policy, to base their discussions on objective knowledge as distinguished from subjective opinion.

The organization of the Bureau is designed to ensure not only scientific and impartial work on the part of its staff, but also a review of their findings by men who represent all the important viewpoints from which economic problems are regarded. Control is vested in a board of nineteen directors. The present constitution of this board is as follows:

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The directors, through their Executive Committee, choose the topics for investigation and appoint the scientific staff. The by-laws provide that all reports made by the staff shall be submitted to the directors for criticism before they are published, and that a director who dissents from any finding approved by the majority of the board shall have his dissenting opinion published in the report if he so desires. The present report owes much to the active coöperation of the directors, and many suggestions made by them are incorporated in the text. It is believed that this critical review of the staff's work by a group of men representing varied training, experience, and opinions safeguards the reports against bias.[1]

The chief financial support of the Bureau has come from two philanthropic foundations, the Commonwealth Fund and the Carnegie Corporation. Several other contributions, none exceeding $1,000, have been made by public-spirited individuals and business enterprises. The General Theological Seminary of New York has generously furnished office space in one of its buildings. To all of these donors the Bureau takes this occasion, its first public opportunity, to express its thanks.

[1] Because of absence in Europe Mr. Fish has not been able to read the present report.

The present report deals with a subject of fundamental importance in which the truth is hard to find—a subject so important that despite manifold difficulties, it has attracted investigators in many countries. Australia took an actual census of wealth and incomes in 1915 as a war measure. Excellent estimates have been made of the national income of Great Britain and Germany, where well-administered income taxes with low exemption limits provide a solid foundation to build upon. Approximations that are less accurate because the underlying statistics are less abundant have been published for France, Italy, Spain, Austria-Hungary, Canada, and Japan. In the United States, statisticians attacked the problem from time to time before the war—notably Charles B. Spahr, Frank H. Streightoff, Willford I. King, and Scott Nearing. They found the American data bulky but miscellaneous and hard to fit together. The war lent the problem pressing importance; and several estimates of the national income, most of them based directly or indirectly upon Mr. King's figures for 1910, were made by men interested in the government's financial policy. These estimates were all rough approximations, hastily constructed. Quite naturally, they differed considerably in their results.

A desire to learn whether the National Income is adequate to provide a decent living for all persons, whether this income is increasing as rapidly as the population, and whether its distribution among individuals is growing more or less unequal, and to sift the divergencies among the current estimates led the National Bureau of Economic Research to choose this field for its first investigation. Its staff was directed to undertake a thorough canvass of all the available materials and to make as close an estimate as possible of the size of the National Income, its variations from year to year in dollars and in goods, and the way in which this income is divided among the people. More than a year has been spent upon this work, the results of which are summarized in the chapters that follow.

Even with the addition of the income-tax tables which have recently become available, the American data leave much to be desired. Moreover, the wild fluctuations of prices, wages, and profits during the war introduce new complications into a task that is difficult under the most stable conditions. Nevertheless, it is believed that the results here presented, while necessarily subject to a margin of error, are more reliable than those which earlier American investigators, working with less

help and fewer data, have been able to obtain; and that, in reliability, these results compare not unfavorably with the estimates available for foreign countries. The Bureau is planning to continue the work of estimating the National Income from year to year on a basis comparable with that followed in this volume. The results for later years will be announced as the necessary data become available.

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# CHAPTER 1

## INTRODUCTION

### I. THE QUESTIONS TO BE ANSWERED

What is the aggregate income of the American people?

How much does that income vary from year to year?

What part of the changes is due to fluctuations in prices and what part to fluctuations in the production of goods?

How is the aggregate income divided among individuals?

What proportion of the whole income goes to wage-earners and salaried employees?

How does per capita income in the United States compare with that in other countries?

These questions mark out the field in which the National Bureau of Economic Research has made its first investigation. The present volume summarizes the answers which the Bureau's staff has been able to obtain by more than a year's work. The second volume of the report shows in detail

the sources from which the data for the answers have been drawn, the methods used by the staff, and the margins of doubt by which their results are bordered. On these topics some general statements are presented here, but the reader who wishes to form his own opinion of the investigation and the results must consult the second volume. He will find there much information about particular industries which does not come into this Summary at all.

## II. MATERIAL AND METHODS

Only one country in the world—Australia—has ever taken a census of incomes. In other countries what is known about the size of the national income and the mode of its distribution rests upon estimates. These estimates can only be made by dovetailing together data that are diverse in form, content, scope, date, and source; bulky at some points, scanty at others, and generally requiring adjustment of some sort before they are fit for use.

Among the important bodies of data that can be used in estimating the income of the United States in recent years are the Internal Revenue Bureau's tables of personal and corporate incomes, many records of wages per hour, day or week, scattered reports on the salaries of teachers and clergymen

and the annual earnings of physicians and engineers, a few investigations into the incomes of farmers, the rent surveys of many towns made by the American Telephone & Telegraph Company, collections of family budgets, the Census statistics of occupations, the quinquennial Census of Manufactures, the Department of Agriculture's annual estimates of the value of the crops, the Geological Survey's data on mineral products, the Interstate Commerce Commission's reports on transportation, monographs on special industries investigated by the Tariff and Federal Trade Commissions, various state and municipal documents dealing with government expenditures, production, wages and the like, statistics compiled by the national associations or service bureaus of leading industries, and the files of technical journals. From all of these sources and from others too numerous to list materials must be collected, compared, criticized and fitted together.

One of the most serious difficulties in working with these data is the difficulty of definition. Precisely what is the National Income? Is it money, or commodities and services, or satisfactions? Is the National Income the sum of the incomes of individuals, or may an individual have personal income which is not income to the nation? Ought

the undistributed incomes of business enterprises to be added to the incomes of individuals to get the total? Ought taxes paid by individuals to be deducted from their incomes? What part of the selling value of an industry's output is produced by the industry itself? What individual incomes are merely parts of other incomes? Are there negative incomes to be deducted from the sum of positive incomes? It is hard enough to tell accurately what is the income of a single family or business, as most people who have struggled with income-tax blanks will testify. It is harder still to frame a definition which will cover both individual and National Income. And it is hardest of all to frame a definition which will include both of these concepts and at the same time enable one to use the exceedingly miscellaneous data from which an estimate of the aggregate must be made.

Fresh complications are introduced by the factor of time, complications which have been magnified by the recent fluctuations in prices. Many of the most valuable pieces of evidence refer to some one year or to two or more years separated by intervals that vary in length. It is necessary to utilize much of this evidence, and desirable to utilize all. Yet complete data are not to be had for any one year; indeed, every year has its special

treasures and its deplorable gaps. To make an acceptable estimate of the National Income for any recent year it is therefore necessary to make an estimate for every recent year and to check these estimates against each other with due allowances for changes in the level of prices. What allowances are "due" on this score is itself a difficult problem.

Clearly, no care taken in working up such data as are now available can guarantee precise results. The task of putting a figure on the National Income is more like the task of valuing a railway system than like the task of drawing up its profit and loss statement. The work must be done in a broad style. It is estimating, rather than enumerating or measuring. In his recent summary of the estimates of the national incomes of the chief powers, Sir Josiah Stamp put in his highest grade those estimates "not likely to be inaccurate to a greater extent than 10 per cent."[1] Judged by this standard, the American estimates for the last two or three years would belong in the highest grade if the errors were not likely to exceed some six billions of dollars.

The estimates, however, need not be uncontrolled. They can, if the work is properly planned

[1] See *Journal of the Royal Statistical Society*, July, 1919, pp. 444-491.

in advance, be safeguarded in considerable measure by a system of cross-checking. As will presently be explained, two independent estimates of the total National Income can be made by distinct methods applied mainly to different collections of data. These estimates can be used to test each other. More than that, most of the large items that enter into each estimate can be arrived at in two or more ways. In the present investigation much attention has been given to devising and applying such tests of the partial results, a branch of the work in which invaluable help has been received from correspondents who have scrutinized our tentative results with expert eyes. Such precautions, to repeat, do not ensure a high degree of accuracy; but they do guard against gross errors.

We have not leaned heavily upon the statistician's fond hope that errors made by the way will cancel each other in the end. Doubtless they do so to some extent and our totals are the better for that fact; but we have tried to make the estimate for each item considered by itself as nearly correct as our data, time, and means have permitted. Of course the estimated errors of our figures vary widely from item to item with the quantity and quality of the underlying statistics. Therefore,

we have been careful to indicate the degree of confidence we feel in the various results. Some readers of the second volume will think that we have been meticulous in our treatment of minor factors. It is true that in very many of the items figures several times too large or too small would not appreciably affect the final aggregates, which run in tens of billions of dollars. But that is another comfort of which we prefer to make sparing use. Many of these minor items have an interest quite independent of their contribution to the total, and if mistakes are found even in the smallest of them by men who have special knowledge of the facts, we shall be grateful for their help in rectifying our estimates.

It is true also that many of the important uses which an estimate of the National Income and its distribution serves, are served almost as well by a fair approximation as by an exact measurement, could such a measurement be made. We have treated that consideration, however, not as an excuse for slighting details, but as a spur to check the validity of our broad results as carefully as possible. These broad results are the matters of chief concern. It is necessary in many of our computations to adopt definite figures of two or three digits to express sub-totals and grand totals.

But we attach no importance to the third digits, except as an aid in computation, and in the great majority of cases, including the grand aggregates of National Income, we regard the second digits as subject to a wide margin of error. The statements in which we have most confidence and to which we attach most importance are put in the form of ranges within which the National Income and its major constituents probably fall.

Finally, we have profited much by the work done in this difficult field by our predecessors in America and in other countries, pioneers who achieved valuable results despite their slender resources and scanty data. Happily, economic statistics is a progressive field, and the latest comers should be able to improve upon the results of earlier workers. We believe that the results presented in this report do constitute an advance beyond earlier American work. But at most they are merely the best approximations we can frame now from the current data. We do not regard the tables in this report as final. On the contrary, we hope to revise our estimates as fresh data become available and as better analytic methods are devised. In this process of constructive criticism and revision of the figures we cordially invite every one interested to share.

### III. THE TWO WAYS OF ESTIMATING THE NATIONAL INCOME

The collections of data listed in the preceding section as available for estimating the National Income are of two kinds. One kind shows income received—the income-tax returns, reports on wages and salaries, investigations of the profits of farmers, and the like. The second kind shows income produced—the statistics of coal and metals mined, lumber cut, crops grown, raw materials transported or manufactured, and the like.

These two kinds of sources cannot both be completely utilized in making a single estimate of the National Income. For how can one combine, for example, the statistics of personal incomes over $2000 compiled by the Internal Revenue Bureau with the statistics of "value added by manufacture" reported by the Census Bureau? Then which set of sources should be used—the set that shows income received, or the set that shows income produced? It is hard to say in advance which set will yield the more trustworthy results, and, in view of the margin of uncertainty to which the best estimates in this field are subject, one is exceedingly reluctant to relinquish the use of any body of data from which help can be had.

The Bureau's solution of this problem is to use both sets of data and to make two independent estimates of the National Income for each year. One estimate, called the "Estimate by Sources of Production," is derived from a study of the separate industrial fields in which the income originates. The second estimate, called the "Estimate by Incomes Received," utilizes the data which show the income received by individuals, plus the income received by business enterprises but not distributed to their owners.

To ensure their independence, these two estimates were made by different members of the staff. Mr. King had charge of the Estimate by Sources of Production and Mr. Knauth of the Estimate by Incomes Received. Not until the last large items in the more laborious estimate had been figured was it possible to tell whether the two parallel investigations were leading up to similar or to widely divergent results. Then it was found that the maximum discrepancy in any year between the two sets of preliminary totals was 7.0 per cent. After the few items in the two estimates which could properly be compared were set against each other, each estimate was critically revised. The object of the revision was not to force the two estimates into agreement, but to

make each considered by itself as perfect as the staff could make it on the basis of the available data. Some of the changes introduced in revision tended to bring the two series closer together, while others tended to force them further apart.

In reporting the outcome of the Bureau's work it is best to begin with the general results and then to take up details. First, the two estimates of the aggregate National Income will be presented in their final form. Next, the more important items of which each estimate is made up will be shown. This exhibit will raise in concrete form the problem whether an estimate of the National Income by sources of production theoretically ought to yield the same results as an estimate by incomes received. Discussion of that problem will pave the way for a consideration of the margin of error in both estimates, of the most probable values of the National Income in the years covered, and of how this income compares with that of other countries. Then will come an estimate of what the enormously inflated money incomes of the war years would amount to if reduced to dollars of constant purchasing power. Last but most interesting of all, we shall consider the way in which the National Income is distributed among individuals.

# CHAPTER 2

## THE SIZE OF THE NATIONAL INCOME

### I. THE TWO ESTIMATES OF THE NATIONAL INCOME COMPARED

Table 1 shows the final figures for the National Income given by the Estimate by Sources of Production and the Estimate by Incomes Received. Certainly the agreement between the two estimates, made as they were independently of each other, is remarkable. The average National Income in the nine years covered by both series works out at 40.2 billions in the Estimate by Sources of Production and at 39.7 billions in the Estimate by Incomes Received. Even the maximum difference of 6.9 per cent. in 1913 is small for work in this field, and in two years, 1911 and 1917, the two estimates happen to agree to the nearest hundreds of millions. On the per capita basis, the maximum difference is but $24 per annum. Indeed, the only difference of note concerns the rate at which the National Income has increased. The increase from 1910 to 1918 is 90 per cent. in one case and 98 per cent. in the other.

TABLE 1

THE TWO ESTIMATES OF THE NATIONAL INCOME

1909-1919

| Year | Estimate by Sources of Production | Estimate by Incomes Received | Differences between the two estimates | | Population of the United States on June 30th[1] | Income per Capita | |
|---|---|---|---|---|---|---|---|
| | | | First greater (+) or less (—) than the Second. | First greater (+) or less (—) than the Second. | | Estimate by Sources of Production | Estimate by Incomes Received |
| | Billions | Billions | Billions | Per Cent. | Millions of Persons | | |
| 1909 | $28.8 | | | | 90.37 | $318 | |
| 1910 | 31.8 | $31.1 | $+ .7 | +2.3 | 92.23 | 344 | $337 |
| 1911 | 31.2 | 31.2 | 0.0 | 0.0 | 93.81 | 332 | 333 |
| 1912 | 33.6 | 32.4 | +1.2 | +3.7 | 95.34 | 352 | 340 |
| 1913 | 35.6 | 33.3 | +2.3 | +6.9 | 97.28 | 366 | 342 |
| 1914 | 33.9 | 32.5 | +1.4 | +4.3 | 99.19 | 342 | 328 |
| 1915 | 36.1 | 35.9 | + .2 | + .6 | 100.43 | 360 | 357 |
| 1916 | 45.4 | 45.5 | — .1 | — .2 | 101.72 | 446 | 447 |
| 1917 | 53.9 | 53.9 | 0.0 | 0.0 | 103.06 | 523 | 523 |
| 1918 | 60.4 | 61.7 | —1.3 | —2.1 | 104.18 | 579 | 592 |
| 1919 | | 66.0 | | | 104.85 | | 629 |

[1] Mr. King's estimate for intercensal years based on the censuses of 1910 and 1920, yearly birth and death rates, and net immigration.

The charts which follow bring out the chief features of Table 1 in graphic form.

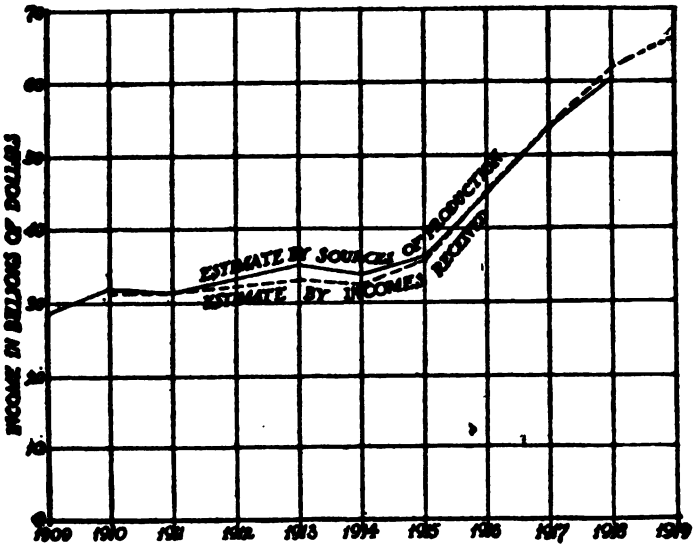
Needless to say, the sudden acceleration during

CHART 1.

THE TWO ESTIMATES OF THE NATIONAL INCOME. 1909-1919.

Based upon Table 1.

For elimination of the increase due to the rise of prices, see Chart 14.




the war in the rate at which the National Income increased was due mainly to the rise of prices—a factor in the situation which will call for careful consideration after the two estimates have been analyzed more closely.

Chart 3, showing the percentage change in the National Income according to the two estimates, is based upon the average amount of the income

CHART 2.

PER CAPITA INCOME ACCORDING TO THE TWO ESTIMATES.

1909-1919.

Based upon Table 1.

For elimination of the increase due to the rise of prices, see Chart 16.

as shown by each of the estimates in the whole period common to both, because that base affords a fairer comparison than would percentages based upon the results for any single year.

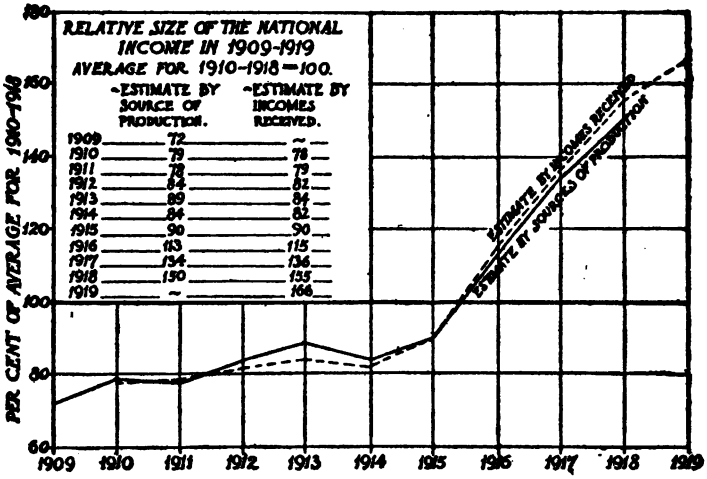
CHART 3.

RELATIVE FLUCTUATIONS IN THE NATIONAL INCOME, ACCORDING TO THE TWO ESTIMATES.

1909-1919.

Based upon Table 1.

For elimination of the increase due to the rise of prices, see Chart 15.




## II. ANALYSIS OF THE ESTIMATE BY SOURCES OF PRODUCTION

The major parts entering into the Estimate by Sources of Production are presented in Table 2. These parts and their subdivisions, shown in detail in Volume II, are determined quite as much by the condition of the data as by the choice of the investigator. The statistics of agricultural production come mainly from the Bureau of the

Census and the Department of Agriculture. Those concerning mineral production are drawn mainly from the Geological Survey. Factory production is estimated on the basis of the quinquennial censuses of manufactures. All these sources are fairly satisfactory, though many ingenious shifts must be resorted to in bridging the gaps between years for which substantially complete data can be had. For most of the hand trades, on the contrary, no census has been taken since 1899, and the best estimates that can be made of their value products[1] in recent years are subject to a wide margin of error. The Interstate Commerce Commission's reports, combined with special census bulletins, again provide a good basis for treating the various branches of transportation, except shipping by water, on which the statistical information is unsystematic and even contradictory in part. Bank statistics are fair, and the financial statistics for states and cities compiled at frequent intervals by the Census, together with the United States Departmental reports, make possible a tolerable approximation to the value product of all branches of government. The last section of the Estimate, "Unclassified industries and miscel-

[1] The "value product" of an industry is the market value added by that industry to the materials, supplies, and services which it obtains from other sources.

Table

ANALYSIS OF THE ESTIMATE

In Millions

| | 1909 | 1910 | 1911 | 1912 | 1913 |
|---|---|---|---|---|---|
| I. Agriculture | $4,686 | $5,728 | $5,368 | $5,286 | $5,887 |
| II. Mineral Production | 904 | 964 | 998 | 1,106 | 1,191 |
| III. Manufacturing | | | | | |
| A. Factories | 6,107 | 6,756 | 6,350 | 7,195 | 7,976 |
| B. Construction | 1,959 | 1,806 | 1,734 | 1,885 | 1,669 |
| C. Other Hand Trades | 656 | 715 | 750 | 800 | 852 |
| IV. Transportation | | | | | |
| A. Railway, Pullman, Express, Switching and Terminal Companies | 1,948 | 2,119 | 2,182 | 2,288 | 2,271 |
| B. Street Railway, Electric Light and Power, Telegraph and Telephone Companies | 614 | 667 | 711 | 768 | 806 |
| C. Transportation by Water | 208 | 248 | 226 | 253 | 258 |
| V. Banking | 484 | 504 | 516 | 521 | 509 |
| VI. Government | 1,440 | 1,542 | 1,622 | 1,716 | 1,829 |
| VII. Unclassified Industries and Miscellaneous Income | 9,824 | 10,722 | 10,786 | 11,796 | 12,332 |
| Total | 28,775 | 31,766 | 31,188 | 33,554 | 35,580 |

In Percentages of

| | 1909 | 1910 | 1911 | 1912 | 1913 |
|---|---|---|---|---|---|
| I. Agriculture | 16.29 | 18.03 | 17.21 | 15.76 | 16.54 |
| II. Mineral Production | 3.14 | 3.04 | 3.18 | 3.30 | 3.35 |
| III. Manufacturing | | | | | |
| A. Factories | 21.23 | 21.27 | 20.36 | 21.44 | 22.42 |
| B. Construction | 6.81 | 5.69 | 5.56 | 5.62 | 4.69 |
| C. Other Hand Trades | 2.28 | 2.25 | 2.41 | 2.38 | 2.39 |
| IV. Transportation | | | | | |
| A. Railway, Pullman, Express, Switching and Terminal Companies | 6.75 | 6.67 | 6.84 | 6.65 | 6.38 |
| B. Street Railway, Electric Light and Power, Telegraph and Telephone Companies | 2.13 | 2.10 | 2.28 | 2.27 | 2.27 |
| C. Transportation by Water | .72 | .76 | .72 | .76 | .78 |
| V. Banking | 1.51 | 1.59 | 1.65 | 1.55 | 1.43 |
| VI. Government | 5.00 | 4.85 | 5.20 | 5.11 | 5.14 |
| VII. Unclassified Industries and Miscellaneous Income | 34.14 | 33.75 | 34.59 | 35.16 | 34.66 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

2

BY SOURCES OF PRODUCTION

of Dollars

| 1914 | 1915 | 1916 | 1917 | 1918 | |
|---|---|---|---|---|---|
| $6,040 | $6,376 | $7,249 | $9,720 | $12,682 | I. Agriculture |
| 1,039 | 1,133 | 1,541 | 1,853 | 2,018 | II. Mineral Production |
| | | | | | III. Manufacturing |
| 6,964 | 7,881 | 12,404 | 14,957 | 16,018 | A. Factories |
| 1,413 | 1,413 | 1,647 | 1,267 | 1,280 | B. Construction |
| 879 | 913 | 1,054 | 1,334 | 1,704 | C. Other Hand Trades |
| | | | | | IV. Transportation |
| | | | | | A. Railway, Pullman, Express, Switching and Terminal Companies |
| 2,105 | 2,288 | 2,699 | 3,093 | 3,684 | |
| | | | | | B. Street Railway, Electric Light and Power, Telegraph and Telephone Companies |
| 829 | 860 | 949 | 1,024 | 1,042 | |
| 286 | 280 | 379 | 442 | 506 | C. Transportation by Water |
| 515 | 582 | 604 | 661 | 767 | V. Banking |
| 1,941 | 2,066 | 2,207 | 3,023 | 5,352 | VI. Government |
| | | | | | VII. Unclassified Industries and Miscellaneous Income |
| 11,975 | 12,367 | 14,685 | 16,506 | 15,318 | |
| 33,936 | 36,109 | 45,418 | 53,860 | 60,366 | Total |

the Total Income

| 1914 | 1915 | 1916 | 1917 | 1918 | |
|---|---|---|---|---|---|
| 17.80 | 17.66 | 15.96 | 18.05 | 21.01 | I. Agriculture |
| 3.06 | 3.14 | 3.39 | 3.44 | 3.33 | II. Mineral Production |
| | | | | | III. Manufacturing |
| 20.52 | 21.82 | 27.31 | 27.77 | 26.53 | A. Factories |
| 4.16 | 3.91 | 3.63 | 2.35 | 2.12 | B. Construction |
| 2.59 | 2.53 | 2.32 | 2.48 | 2.82 | C. Other Hand Trades |
| | | | | | IV. Transportation |
| | | | | | A. Railway, Pullman, Express, Switching and Terminal Companies |
| 6.20 | 6.34 | 5.94 | 5.74 | 6.10 | |
| | | | | | B. Street Railway, Electric Light and Power, Telegraph and Telephone Companies |
| 2.44 | 2.38 | 2.09 | 1.90 | 1.73 | |
| .70 | .78 | .83 | .78 | .84 | C. Transportation by Water |
| 1.52 | 1.47 | 1.33 | 1.23 | 1.27 | V. Banking |
| 5.72 | 5.72 | 4.86 | 5.61 | 8.87 | VI. Government |
| | | | | | VII. Unclassified Industries and Miscellaneous Income |
| 35.29 | 34.25 | 32.34 | 30.65 | 25.38 | |
| 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | Total |

laneous income," is the least satisfactory. The largest single item is the value product of wholesale and retail merchants. Less is known concerning the volume of business transacted by merchants, and the values that they add to the goods they distribute, than about any other important part of the nation's business.

There are two ways of estimating the value product that should be credited to any industry. The most satisfactory way, and the way followed when the data permit, is to start with the aggregate selling value of the industry's output and subtract the total cost of all goods which the industry in hand buys from other industries separately represented in the estimate. For example, raw materials, fuel or power, current supplies of various sorts, interest on bank loans, dividend or interest payments to corporations, freight charges, and taxes are generally deducted because in most cases they can be credited to other heads. Further deductions are made for depreciation and obsolescence, in order that the income may be reckoned net. What is left constitutes the value product of the industry in hand. This value product is paid out to employees as wages, salaries, pensions, or compensation for injuries; to landlords as rent; to individual creditors as interest

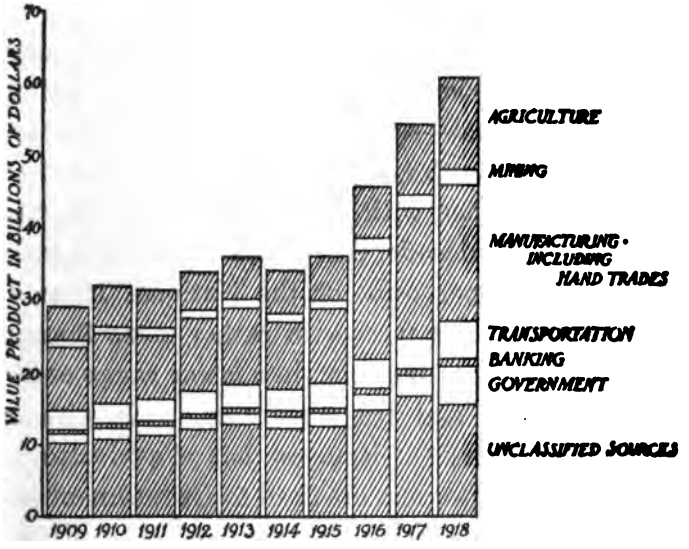
on bonds or mortgage loans; to owners as profits or dividends; and any remainder is kept in the business as additional working capital. The second way of estimating value product (a method

CHART 4.

CONTRIBUTIONS TO THE NATIONAL INCOME MADE BY THE VARIOUS INDUSTRIES.

1909-1918.

Based upon Table 2.




necessarily used in most cases because of the nature of the data available) is based on this division of the proceeds. Where one can get satisfactory data for estimating total payments to employees, landlords, bond or mortgage holders, stockholders

or partners, and surpluses, one can add up these items and take the total as an approximate figure for the value product.

In using the results which Mr. King has been able to reach in one or the other of these ways, one must discriminate between the items which have a moderate and those which have a wide margin of error. The probable degree of error in each item is discussed in Volume II.

The lower half of Table 2 indicates that among the great branches of production, manufacturing holds first place—certainly if the value product of the hand trades, which include construction work, is combined with that of factories. On the average of the decade, this source is credited with producing 30 per cent. of the National Income. Agriculture comes next with rather more than a sixth of the total; and then, in a lower range come merchandising and transportation, each with a product about half as large as that of agriculture. Of course, the product credited to Government increased rapidly during the war, so that by 1918 its percentage of the total was almost equal to that of transportation. The contributions of mining and banking belong in a lower order of magnitude; mines provide less than a thirtieth and banks less than a fiftieth of the total value product.

TABLE 3

PERCENTAGES OF THE NATIONAL INCOME CONTRIBUTED BY THE VARIOUS INDUSTRIES

1909-1918

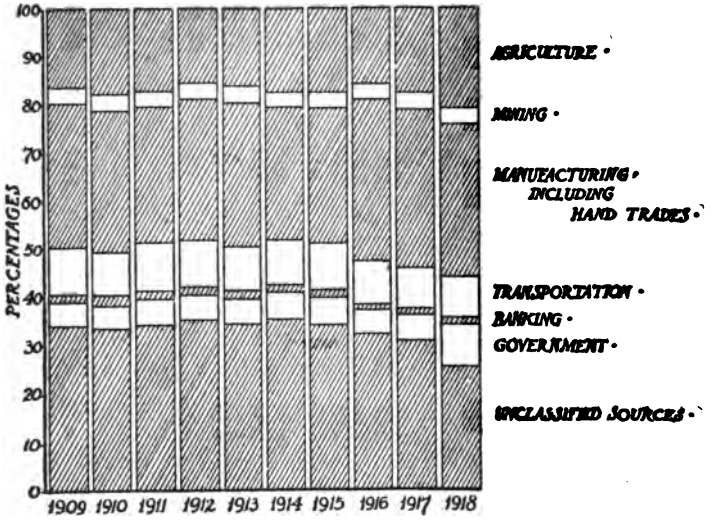
| Year | Agriculture | Mineral Production | Manufacturing, Including Hand Trades | Transportation | Banking | Government | Unclassified Industries and Miscellaneous Income | All Industries |
|---|---|---|---|---|---|---|---|---|
| 1909 | 16.29 | 3.14 | 30.32 | 9.60 | 1.51 | 5.00 | 34.14 | 100.00 |
| 1910 | 18.03 | 3.04 | 29.21 | 9.53 | 1.59 | 4.85 | 33.75 | 100.00 |
| 1911 | 17.21 | 3.18 | 28.33 | 9.84 | 1.65 | 5.20 | 34.59 | 100.00 |
| 1912 | 15.76 | 3.30 | 29.44 | 9.68 | 1.55 | 5.11 | 35.16 | 100.00 |
| 1913 | 16.54 | 3.35 | 29.50 | 9.38 | 1.43 | 5.14 | 34.66 | 100.00 |
| 1914 | 17.80 | 3.06 | 27.27 | 9.34 | 1.52 | 5.72 | 35.29 | 100.00 |
| 1915 | 17.66 | 3.14 | 28.26 | 9.50 | 1.47 | 5.72 | 34.25 | 100.00 |
| 1916 | 15.96 | 3.39 | 33.26 | 8.86 | 1.33 | 4.86 | 32.34 | 100.00 |
| 1917 | 18.05 | 3.44 | 32.60 | 8.42 | 1.23 | 5.61 | 30.65 | 100.00 |
| 1918 | 21.01 | 3.33 | 31.47 | 8.67 | 1.27 | 8.87 | 25.38 | 100.00 |
| Average 1909 to 1918 | 17.43 | 3.24 | 29.97 | 9.28 | 1.45 | 5.61 | 33.02 | 100.00 |

CHART 5.

PERCENTAGES OF THE NATIONAL INCOME CONTRIBUTED BY THE VARIOUS INDUSTRIES.

1909-1918.

Based upon Table 3.




These rough rankings (except in the case of merchandising) are justified by the summary figures of Table 3 and illustrated by Charts 4 and 5.[1]

Table 3 suggests a further set of observations

[1] For the very rough figures concerning the value product of retail and wholesale merchants, see Mr. King's discussion in Volume II. It may be well to add that the percentages given in the text throw little light on the not infrequent assertion that "it costs as much to sell goods as to make them." For the selling work done by farmers, manufacturers, mining companies, railways, and the like is here credited as part of the value product of these branches of business.

concerning the change in the value products of the several industries from year to year. A simpler approach to the problem, however, is provided by Table 4, which takes the value product of each industry in 1913 as 100 and expresses its output in other years by proportional figures. As between the beginning of the period and 1918, government shows much the most rapid growth—for 1918 saw the vast expansion of federal activities caused by the war. Agriculture ranks next. Then in order come manufacturing, mining, transportation and banking. The miscellaneous group comes last mainly because, besides merchandising, it contains considerable items in which the increase was relatively small, for example, the value product of the professions like medicine and law which are practised by men not attached to any industry, the rental value of homes occupied by their owners, an allowance for interest on consumption goods owned by families, and the like.

These figures, be it recalled once more, purport to show changes in the values added by the several industries to what they buy, not changes in the gross value of products. Of course they are affected not only by the growth in the physical scale of operations, but also by fluctuations in the prices which each industry had to pay for what it bought

TABLE 4

RELATIVE FLUCTUATIONS IN THE VALUE PRODUCTS OF THE VARIOUS INDUSTRIES

1909-1918

Value Product from Each Source in 1918 = 100

| Year | Agriculture | Mining | Manufacturing, including Hand Trades | Transportation | Banking | Government | Unclassified Sources |
|---|---|---|---|---|---|---|---|
| 1909 | 80 | 76 | 83 | 83 | 85 | 79 | 80 |
| 1910 | 97 | 81 | 88 | 91 | 99 | 84 | 87 |
| 1911 | 91 | 83 | 84 | 92 | 101 | 89 | 87 |
| 1912 | 90 | 93 | 94 | 97 | 102 | 94 | 96 |
| 1913 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914 | 103 | 87 | 88 | 95 | 101 | 106 | 97 |
| 1915 | 108 | 95 | 97 | 103 | 105 | 113 | 100 |
| 1916 | 123 | 129 | 144 | 121 | 119 | 121 | 119 |
| 1917 | 165 | 156 | 167 | 136 | 130 | 165 | 134 |
| 1918 | 215 | 169 | 181 | 157 | 151 | 293 | 124 |

from other industries, as well as by the prices at which it could sell. The relative fluctuations of these three factors were widely different in different industries, and these dissimilar fluctuations go far to explain the net results shown in the tables. In Table 2, for example, one can trace the restrictions imposed as a war measure upon ordinary building operations in the figures for the hand trades in 1917-1918. Again, in Table 3, the public regulation of rates is largely responsible for the decline of the relative value of the contribution to the National Income made by the transportation group in the later years covered by the table. Once more, the high prices of farm products had much to do with the sudden increase in agriculture's share in the National Income in the war years.

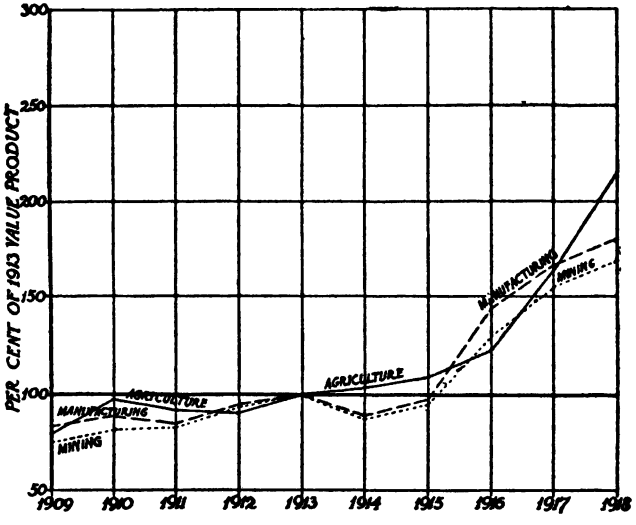
Table 4 and its accompanying charts also throw light on the correspondence between the value produced by different industries and the course of business cycles. Mineral production, manufactur-

CHART 6.

RELATIVE FLUCTUATIONS IN THE VALUE PRODUCTS OF AGRICULTURE, MINING, AND MANUFACTURING. 1909-1918.

Value Product from each Source in 1913 = 100.

Based upon Table 4.




ing and transportation all show markedly the effect of the severe depression of 1914. Agriculture, on the contrary, in which the weather counts at least as much as business conditions, turned out a larger value product in that year than in any

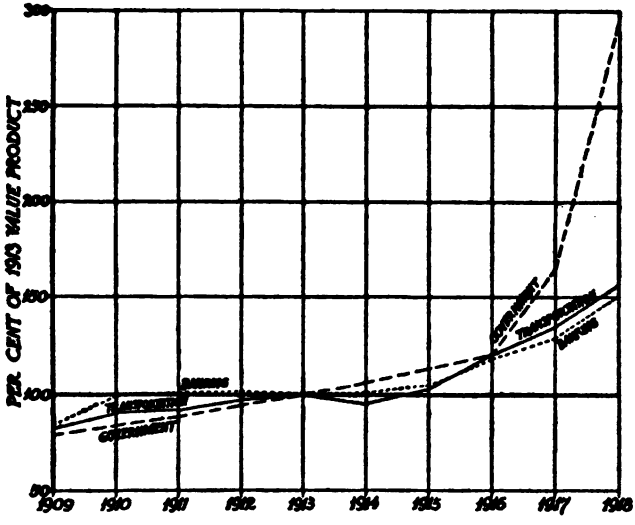
of its predecessors. On the other hand, agriculture shows a drop in 1912 when mining, manufacturing and transportation made considerable gains. Government is even less affected by busi-

CHART 7.

RELATIVE FLUCTUATIONS IN THE VALUE PRODUCTS OF TRANSPORTATION, BANKING, AND GOVERNMENT. 1909-1918.

Value Product from each Source in 1913 = 100.

Based upon Table 4.




ness cycles than farming. It is the only source of production shown by the table in which every year, good, bad, or indifferent, marks an increase over the year before. The post-war years, however, will doubtless show declines from the war peak.

### III. ANALYSIS OF THE ESTIMATE BY INCOMES RECEIVED

The form of the Estimate by Incomes Received, like that of the Estimate by Sources of Production, was determined primarily by the data that had to be used.

This estimate gives first the aggregate incomes received by persons having more than $2,000 per year, because since 1917 the income tax has required returns from all such persons whether married or single. These official statistics are basic, but they require various adjustments. (1). The income tax returns for 1913-16, when the exemption limit was $3,000, must be increased to include incomes between two and three thousand. (2). A rather conjectural backward extension of the series must be made to cover 1910-12, when there was no income tax. (3). Allowance must be made for under-reporting and—a much larger factor—for non-reporting of taxable incomes. (4). Tax-exempt income, consisting of interest on certain classes of bonds, salaries of state officials, the rental value of homes occupied by their owners, and the food and fuel consumed directly by the farmers who produce it must be added.

Taken together, these items run into large fig-

ures. The elaborate details of these estimates are explained by Mr. Knauth in the second volume. Here it must suffice to contrast the aggregate income which his estimate gives with that reported by the Internal Revenue Bureau in successive years. The narrowing margin between the two series is due not only to the reduction of the exemption limit in 1917, but also to increased efficiency in tax administration. Even in 1919, however, the margin remains considerable.

| | Aggregate Personal Incomes over $2,000 in the Estimate by Incomes Received | Aggregate Net Personal Incomes Reported by the Internal Revenue Bureau above the limits stated in next column | Lower Income Limits of the Official Figures quoted |
|---|---|---|---|
| 1913..... | $10.2 billions | $ 3.9 billions | $3,000 |
| 1914..... | 9.9 " | 4.0 " | 3,000 |
| 1915..... | 11.4 " | 4.6 " | 3,000 |
| 1916..... | 15.6 " | 6.3 " | 3,000 |
| 1917..... | 20.9 " | 11.2 " | 2,000 |
| 1918..... | 23.2 " | 13.7 " | 2,000 |
| 1919..... | 25.2 " | 17.0 " | 2,000 |

The second section of the estimate, dealing with incomes less than $2,000 per year, is made from a wide variety of sources. The number of these incomes is estimated on the basis of the number of persons having gainful occupations according to the censuses of 1910 and 1920, after subtracting persons having more than $2,000 per year. Average annual earnings for all the important occupations were then estimated from records of wages,

salaries, family budgets, and special investigations of certain professions such as teaching and the ministry. Such material is abundant, though unsystematic, and affords many opportunities for checking one source against another. The final results are the sums of the products obtained by multiplying estimated numbers in different occupations by estimated annual earnings.

Farmers were treated apart as a single group, at first without any attention to the $2,000 line, because most of the available data are in the form of aggregates or averages. These figures come from the Department of Agriculture and from special investigations of farmers' incomes made at the agricultural colleges. Mr. Knauth has devised three independent methods of arriving at a total for each year and the three yield similar results. Finally, his figures were critically examined by the most competent authorities in this difficult field.

Tax-exempt income includes not only interest on tax-exempt bonds, which can be approximated rather closely, but also the rental value of homes occupied by their owners, and the salaries of state officials receiving more than $2,000 per year. The farm products consumed by the families that produce them are included in the separate estimate of

farmers' incomes. The rental value is a very rough figure, but does not bulk large in the total National Income.

Last comes corporate surplus. After a study of the facts, Mr. Knauth concluded that at least 80 to 90 per cent of this item represents net income retained by corporations and used for the extension or safeguarding of business. Of course 1916 and 1917 were years of exceptionally large profits, and it is probable that the estimates of the National Income for 1920 and 1921, when they come to be made, will show heavy losses by many of the corporations which accumulated large surpluses during the war. Corporation-tax data, supplemented by the financial reports of corporations published in handbooks like Moody's Manual, afford a fair basis for ascertaining the yearly magnitude of this item, variable as it is. No similar estimate is included for partnerships or business enterprises owned by a single individual, because partners and individuals are required to report their full profits to the income-tax authorities—if their incomes rise above $2,000—whether they have drawn the money out of their business or not.

In studying the result of all this work as summarized in Table 5, the reader will note that Mr.

Knauth's estimate of the incomes received by farmers runs on a distinctly lower level than Mr. King's estimate of the value produced by agriculture. For the nine years common to both estimates, Mr. Knauth gets an average income of about 5.5 billions for farmers out of an average of 39.7 billions for all incomes, or about 13.9 per cent. of the whole. Mr. King, on the other hand, obtains an average value product for agriculture of about 7.1 billions, or approximately 17.7 per cent. of his estimate of the average National Income (40.2 billions). But this difference is about what it should be and confirms the substantial accuracy of the two investigations; for the value product of agriculture contains important items which are costs, not income, to farmers—namely, money wages, board and lodging of agricultural laborers, interest on farm mortgages, and rents of farms cultivated by tenants. When these items are subtracted from Mr. King's figure for the value product of agriculture, the remainders agree substantially with Mr. Knauth's figures for the income of farmers. Moreover, there is shown a more rapid increase of farmers' incomes than of farm value products, for, like most classes of men doing business on their own account, farmers profited by the war-time rise of

prices at the expense of employees, landlords, and lenders. Agricultural wages, rents, and interest on mortgage loans rose during 1917 and 1918 at a rapid rate, but not at a rate so rapid as that of the increase in the selling prices of agricultural products.

It is not worth while to analyze elaborately the results shown by Table 5 for incomes over and under $2,000; for the omission of farmers makes both of these groups incomplete. In discussing the distribution of incomes in section II of chap-

TABLE

ANALYSIS OF THE ESTIMATE

(In Billions

| Personal Incomes. | 1910 | 1911 | 1912 |
|---|---|---|---|
| Tax-Exempt Income | $ .8 | $ .8 | $ .8 |
| Over $2,000 per year except farmers | 8.8 | 8.6 | 8.8 |
| Under $2,000 per year except farmers | 16.3 | 17.2 | 17.9 |
| Farmers | 4.0 | 3.7 | 4.0 |
| Total | $29.9 | $30.3 | $31.5 |
| Corporate Surplus | 1.2 | .9 | .9 |
| Total National Income | $31.1 | $31.2 | $32.4 |

(In Percentages

| Personal Incomes. | 1910 | 1911 | 1912 |
|---|---|---|---|
| Tax-Exempt Income | 2.57 | 2.56 | 2.47 |
| Over $2,000 per year except farmers | 28.29 | 27.57 | 27.16 |
| Under $2,000 per year except farmers | 52.42 | 55.13 | 55.25 |
| Farmers | 12.86 | 11.86 | 12.34 |
| Total | 96.14 | 97.12 | 97.22 |
| Corporate Surplus | 3.86 | 2.88 | 2.78 |
| Total National Income | 100.00 | 100.00 | 100.00 |

ter 3, we shall divide the farmers in the same way as the rest of the population, and so get more significant figures. It is sufficient here to point out that the fluctuations in the relative size of these two classes are very considerable. Income under $2,000 varies from about 45% of the National Income in 1917 to 56% in 1914. Income over $2,000, on the contrary, varies from over 29% of the total in 1916 and 1917 to less than 27% in 1914 and 1918. Two sets of changes have combined to produce these curious results. (1). Busi-

5

BY INCOMES RECEIVED

of Dollars)

| 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|---|---|---|---|---|---|---|
| $ .8 | $ .8 | $ .9 | $ .9 | $ 1.0 | $ 1.2 | $ 1.4 |
| 9.0 | 8.7 | 10.0 | 13.5 | 16.0 | 16.2 | 17.5 |
| 18.3 | 18.3 | 18.7 | 21.4 | 24.7 | 32.1 | 34.9 |
| 4.2 | 4.2 | 4.7 | 5.8 | 8.8 | 10.5 | 10.9 |
| $32.3 | $32.0 | $34.3 | $41.6 | $50.5 | $60.0 | $64.7 |
| 1.0 | .5 | 1.6 | 3.9 | 3.4 | 1.7 | 1.3 |
| $33.3 | $32.5 | $35.9 | $45.5 | $53.9 | $61.7 | $66.0 |

of Total Income)

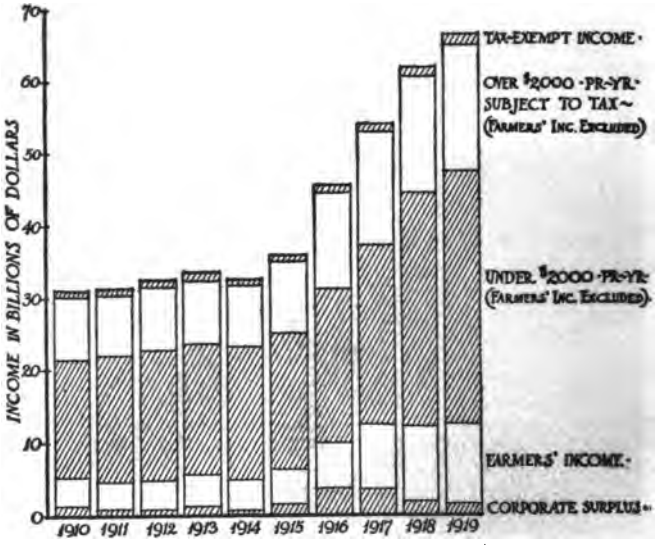
| 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|---|---|---|---|---|---|---|
| 2.40 | 2.46 | 2.51 | 1.98 | 1.85 | 1.94 | 2.12 |
| 27.03 | 26.77 | 27.85 | 29.67 | 29.68 | 26.26 | 26.51 |
| 54.96 | 56.31 | 52.09 | 47.03 | 45.83 | 52.03 | 52.88 |
| 12.61 | 12.92 | 13.09 | 12.75 | 16.33 | 17.02 | 16.52 |
| 97.00 | 98.46 | 95.54 | 91.43 | 93.69 | 97.25 | 98.03 |
| 3.00 | 1.54 | 4.46 | 8.57 | 6.31 | 2.75 | 1.97 |
| 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

ness depression cuts down profits and therefore the larger incomes (in which profits and dividends are a large fraction) more severely than it cuts down wages and salaries (which make the bulk of

CHART 8.

THE FIVE SECTIONS OF THE NATIONAL INCOME ACCORDING TO THE ESTIMATE BY INCOMES RECEIVED. 1910-1919.

Based upon Table 5.




the lower incomes). A sudden increase of business prosperity has the opposite effect. But when prosperity continues for some time, profit margins are narrowed by the gradual advance of wages and salaries. (2). This advance of wages

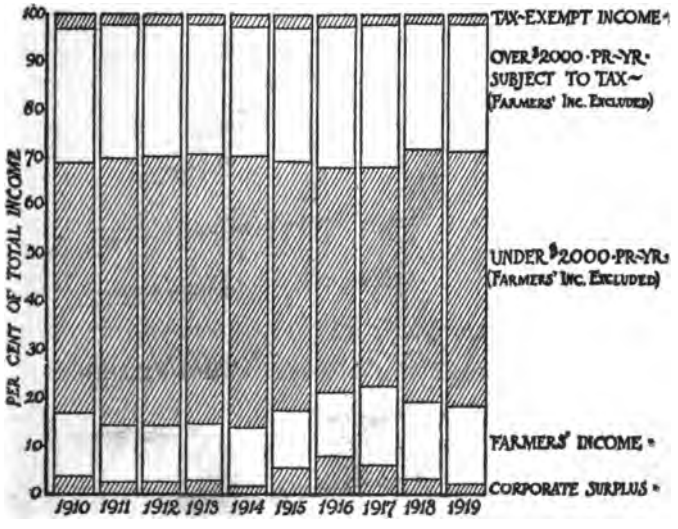
and salaries increases the amount of income in the "under-$2,000" group, until the advances have carried many wage and salary earners above the $2,000 line. When that happens, the percentage

CHART 9.

PERCENTAGE DIVISION OF THE NATIONAL INCOME ACCORDING TO THE ESTIMATE BY INCOMES RECEIVED.

1910-1919.

Based upon Table 5.




of total income in the lower group declines sharply. These two factors—the effect of business conditions upon profits and upon incomes from personal service in the neighborhood of $2,000 per year—may in a given year either reinforce or

counteract each other. Hence, the peculiar results.

Tax-exempt income from securities, home ownership and state salaries, is at all times a minor item, averaging 2.26% of the total. It was increased of course in 1917 and 1918 by the issue

TABLE 6

RELATIVE FLUCTUATIONS IN THE ITEMS INCLUDED IN THE ESTIMATE BY INCOMES RECEIVED

1910-1919

(Income in 1918 = 100)

| Year | Personal Income | | | | | Corporate Surplus | Total National Income |
|---|---|---|---|---|---|---|---|
| | Over $2,000 per year excluding farmers | Under $2,000 per year excluding farmers | Farmers[1] | Tax-exempt income | Total personal income | | |
| 1910 | 98 | 89 | 95 | 100 | 93 | 120 | 93 |
| 1911 | 96 | 94 | 88 | 100 | 94 | 90 | 94 |
| 1912 | 98 | 98 | 95 | 100 | 98 | 90 | 97 |
| 1913 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914 | 97 | 100 | 100 | 100 | 99 | 50 | 98 |
| 1915 | 111 | 102 | 112 | 112 | 106 | 160 | 108 |
| 1916 | 150 | 117 | 138 | 112 | 129 | 390 | 137 |
| 1917 | 178 | 135 | 210 | 125 | 156 | 340 | 162 |
| 1918 | 180 | 175 | 250 | 150 | 186 | 170 | 185 |
| 1919 | 194 | 191 | 260 | 175 | 200 | 130 | 198 |

of war loans exempt from taxation in whole or in part, by the rise in rental values, and by the stimulus which exemption from high income taxes gave to the purchase of homes by families of means. Yet, if Mr. Knauth's data are trust-

[1] Mr. Gray Silver, a Director of the Bureau, remarks:

The income received by a farmer arises from his own services and those of the housewife for which an estimate has been made, and from work performed by unpaid members of his family. In certain years, when help is scarce (1918, 1919, 1920), this is the reserve drawn upon to maintain the needed agricultural production. This help therefore increases the farmer's share of the national income in these years beyond what it would have been had he paid for the services rendered by his family at commercial rates.

worthy, this increase was less rapid than the increase in the larger items of the estimate. Hence, the tax-exempt income of persons receiving a total income over $2,000 per year constituted a smaller

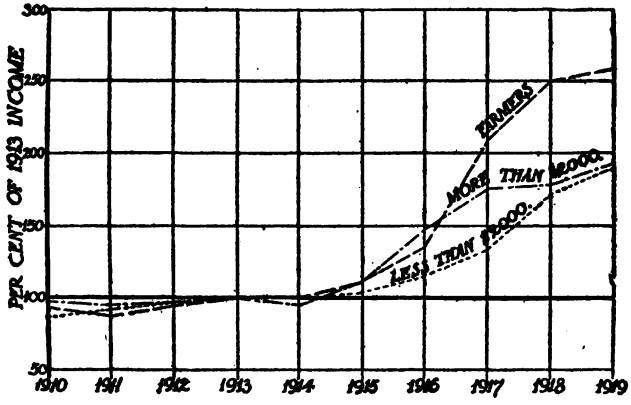
CHART 10.

RELATIVE FLUCTUATIONS IN THE AGGREGATE INCOMES OF FARMERS AND OF ALL OTHER PERSONS SUBDIVIDED ACCORDING TO WHETHER THEY RECEIVE MORE OR LESS THAN $2,000 PER YEAR.

1910-1919.

Aggregate Income Received by Each Group in 1913 = 100.

Based upon Table 6.




proportion of total income in 1919 than in the years before the war. Once more it should be noted that farmers, with their large tax-exempt incomes from home-ownership and food and fuel produced by themselves, are not included in these figures.

Corporate surplus is by far the most variable type of income, fluctuating through an even wider range than the profits of which it is part. How much more variable it is than personal income

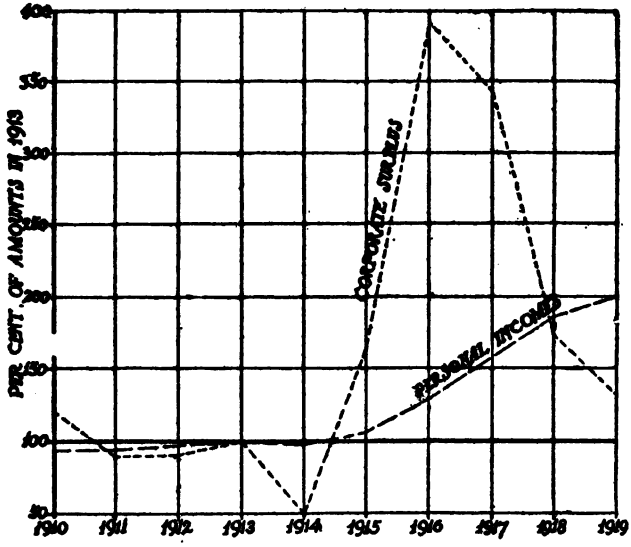
CHART 11.

RELATIVE FLUCTUATIONS IN AGGREGATE PERSONAL INCOMES AND IN CORPORATE SURPLUS.

1910-1919.

Amounts in 1913 = 100.

Based upon Table 6.




is shown by Table 6 and Chart 11. In years when profits are low, American corporations often reduce their dividend rates, but they are reluctant to reduce dividends as sharply as profits have

fallen. On the other hand, when profits are uncommonly high, they seldom disburse the whole of their increased gains. In addition to the policy of stabilizing dividends, American corporations like to follow the conservative financial policy of obtaining a part of the capital required by expansion of business from current earnings, instead of raising the whole amount by new security issues, and their capital needs grow faster in active than in dull years. The period covered by the present study includes one year of extreme depression, 1914, and one year of extraordinary profits, 1916. Even in the first of these years, corporate surplus amounted to $526,000,000; but in 1916 it rose to $3,866,000,000—over seven times the amount in 1914. In 1917, also, corporate surplus was large; but the rising costs of doing business, and war taxes had begun to eat into profits, a process that continued in 1918 and 1919, reducing the surpluses of the latter years to less than two billions each.

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The preceding analysis of the elements of which the two Estimates of the National Income are composed raises in concrete form certain theoretical issues that must next be faced. Are the differences between the two estimates due wholly to

imperfections of the data and to the personal equations of the investigators? Or are there differences of principle between an estimate based upon values produced and one based upon incomes received? To answer these questions, we must consider what elements of income enter into each estimate.

### IV. WHAT THESE ESTIMATES COUNT AS NATIONAL INCOME

The fundamental concept of the National Income which underlies the Estimate by Sources of Production is the same as that underlying the Estimate by Incomes Received. In both estimates the National Income is taken to consist of the commodities and services produced by the people of the country or obtained from abroad for their use, with the omission of goods for which no price is commonly paid, for example the services of housewives. Agricultural produce consumed by the families that produce it, mainly food and firewood, is included, and so also is the rental value of homes occupied by their owners. Finally, income is reckoned on a net basis, that is, negative income, maintenance and depreciation charges are deducted, but not "extensions and betterments."

Though defined thus as an aggregate of commodities and services, the magnitude of the National Income is stated in dollars—of necessity. The Estimate by Sources of Production aims to show the money value of the goods contributed to the aggregate by every productive agency. This money value is derived from the selling prices of the goods. But selling prices constitute income to some one and are paid out as wages, interest, rent and profits, or retained as undistributed income in some business. That holds true in the end even when money from sales is spent immediately for the purchase of new commodities. Hence it seems that an estimate of the incomes received by all individuals, plus the undistributed incomes of business enterprises, should produce the same figures as the Estimate by Sources of Production, were the data complete and correct on all heads.[1]

This conclusion would be valid if the statistics of individual and of undistributed business incomes included without omissions or duplications the money value of just those goods which we reckon in the National Income. But statistics of individual and undivided business incomes are not

[1] The reader may be reminded, once more, that in many industries the Estimate by Sources of Production itself was made by adding wages, interest, profits, etc.

compiled on that basis. For example, an advance in the selling prices of town lots, farm lands or other property does not represent an increase in National Income as above defined, unless it results from improving the property. But such an advance does enable owners to increase their personal incomes by making profitable sales. Nor is it easy to think of their gains as offset by corresponding losses inflicted on the buyers. On the other hand, a drop in these prices would not mean a loss of National Income, though it would occasion income losses to many owners, uncompensated by equivalent increase of income to those who purchase. So far as such gains and losses get into our data for individual incomes and corporate surpluses, then, the Estimte by Incomes Received differs in scope from the Estimate by Sources of Production.

But the present estimates are protected from a large discrepancy on this score by the imperfections of the available data and by the technicalities of the income-tax law. It seems certain, for example, that most of the farmers who sold land at the high prices of 1918-19 failed to report their profits for taxation, perhaps telling their consciences that those profits were not income but increase of capital. Doubtless, thousands of owners

of other kinds of property did likewise. Further, in a period of rapidly advancing prices, the taxpayer has a strong incentive not to sell property that has risen in value. He also has a strong incentive to make loss-taking sales of property that has depreciated in value. It is notorious that the latter practice has been indulged in on a grand scale, especially since the armistice was signed. So it happens that the "Profits from sales of real estate, stocks, bonds, etc.," reported to the Internal Revenue Bureau make but a minor item in their tables of total net income—less than 3 per cent. in 1917 and less than 2 per cent. in 1918. Moreover it may well be that these moderate profits are nearly offset or more than offset by losses on similar sales which are included under "General Deductions."[1] Finally, part of the increase in the selling values of property arises from improvements, and this part does represent

[1] The pertinent figures as given in Statistics of Income, 1917 (pp. 36-39) and 1918 (pp. 42, 43), are as follows:

| | Total income | General deductions | Net income | Profits from sales of real estate, stocks, bonds, etc. |
|---|---|---|---|---|
| | Millions of dollars | Millions of dollars | Millions of dollars | Millions of dollars |
| 1917 | $12,077 | $886 | $11,191 | $318 |
| 1918 | 17,746 | 1,821 | 15,925 | 291 |

No similar figures for earlier years have been published and the tables for 1919 are not yet completed.

National Income. As matters stand, then, we should probably make the Estimate by Incomes Received worse rather than better if we introduced any deduction for profits arising from changes in the capital value of property.

A second doubt about the comparability of the two estimates centers in the treatment of corporate surplus. Mr. Knauth has found evidence that the 80 to 90 per cent. of the reported surplus which he includes in the Estimate by Incomes Received is real income devoted to the extension of business in the same way as money raised by new security issues. The margin not thus included probably represents some cases of poor accounting, but mainly the accumulation of a reserve to meet unforeseen contingencies, which may fairly be regarded as one of the costs which most long-lived enterprises have to meet.

The difficult problem is whether this item should be added to individual incomes. Do not stockholders manage to turn corporation profits that are not distributed into individual income? Certainly they often do so by selling their stocks at values enhanced by the additions made to surplus out of earnings. And if all stockholders followed this practice, or even if they reported their incomes on the basis of accruals, this item would be

counted twice in the Estimate by Incomes Received as here made.

But if what has just been said about current practice in reporting income for taxation is valid, the extent of double counting at least in 1917-18, must be slight—some fraction of the small percentage of total net income reported as "Profits from sales of real estate, stocks, bonds, etc." The high rates of taxation in these years, especially the high rates of super-tax, made it financially desirable not to "realize" income which could be tacitly saved by merely holding the securities on which it was accumulating. This motive was by no means so strong in 1913-16, and there may well be relatively more double counting of income in these years. The amounts of surplus involved, however, were not great before 1916, and since the corporate surplus set aside in any given year is not likely to be "realized" to a large extent by stockholders within that same year, the process of turning the enormous corporate surplus of 1916 into individual income was checked by the high tax rate of 1917. Further, there is reason to believe that the corporate surpluses reported in our tables for 1916 and 1917, huge as they are, understate the undistributed incomes of corporations. The extraordinary profits that were being made in

those years, the uncertainty how long the war demand would last and what conditions peace would bring, combined with the excess-profits tax to make the financial managers of corporations charge off enormous sums for depreciation, special reserves, and other items which can be treated as costs and concerning whose proper size there is wide latitude for judgment. That profits thus concealed were heavily drawn upon to meet the post-war readjustments of 1919 and the inventory losses of 1920-21 of course does not mean that these profits were not real income in 1916-18. It means simply that this income was paid into a suspense account from which losses of income were met in later years.

In view of all these considerations, for our period, the Estimate by Incomes Received probably gives a better approximation to the aggregate size of the National Income when corporate surpluses are added to individual incomes than when they are not. Under different conditions—say the repeal of the super-taxes or the requirement that all individual incomes should be reported on the basis of accruals—the opposite conclusion might be justified.

The treatment in the two estimates of taxes and

of the contribution made by the government to the National Income raises another doubt.

In the Estimate by Incomes Received we have not deducted taxes from personal incomes as reported in the sources. But income-tax payers are permitted to deduct taxes other than inheritance taxes, federal income taxes, and special assessments for the improvement of real estate in arriving at the net income which figures in our estimates. What these deductions amount to is not stated. Corporation taxes, moreover, are deducted from corporation receipts in arriving at our estimate of corporate surplus. On the other hand, incomes paid by the federal, state and local governments to their employees and creditors are included in this estimate, whether they are paid from the proceeds of taxes or loans or from other receipts.

In the Estimate by Sources of Production most of the data concerning the value products of industry come into our hands with taxes already deducted; and to preserve uniformity, we have deducted taxes in the cases where we had the option. As an offset, the value products of the federal, state and local governments have been estimated and included in our totals on substan-

tially the same basis as the value products of privately-managed enterprises.

These procedures were not chosen by us but forced upon us by the condition of the data. However, it is worth while to consider what course we should like to adopt in treating taxes and the government's contribution to the National Income, if the data gave us a perfectly free hand, for that is the best way of judging whether the procedures forced upon us have made our results too high or too low.

Take first the Estimate by Incomes Received. Here it is clear that incomes paid to individuals by governments should count on the same basis as other incomes. Ought we not, then, to deduct from personal incomes the amounts which governments collect as taxes and redistribute as wages, salaries, pensions, rents, and interest—provided we could get at the facts? No, at least not so far as those who receive incomes from governments are contributing direct services of corresponding value which form part of the National Income. This is the answer dictated by our fundamental criterion of what constitutes National Income. And its justification is plain. When, for example, a city taxes its inhabitants to pay school teachers, the people presumably get value received for their

money, and there is no more reason why we should deduct school taxes from individual incomes than why we should deduct the fees paid by the rest of the community to physicians.

The difficult questions of theory and fact come in when we ask whether government expenditures, taken item by item in any given year, really represent services of corresponding value contributed in that year to the National Income. For example, granted that war expenditures represent National Income produced in the years of the conflict, does interest paid in later years on war debts represent services contributed in these later years to the National Income, or does it represent simply a redistribution of the National Income among the citizens—taking money from tax-payers and giving it to bond-holders? Into this delicate field of inquiry we do not enter. Hence we are not sure whether in taking the reports of individual incomes as we find them, with some taxes deducted and others not, we are making the Estimate by Incomes Received too large or too small.

A somewhat more definite conclusion can be reached about the Estimate by Sources of Production, because all reported business taxes have been deducted in reckoning the value product of

industries. Is this deduction in all cases desirable?

What we are seeking here is the aggregate money value of all commodities and services contributed to the National Income year after year by all productive agencies, including governments. Suppose that we start by estimating the value product of government, and then face the tax problem as it crops up in estimating the value products of privately-managed industries.

The taxes that a factory pays are its contribution toward the cost of the services rendered by governments just as the freight it pays is its contribution toward the cost of the services rendered by railways. Is there any difference between taxes and freight charges that justifies us in treating the two items differently when we are estimating the value product of the factory? The freight bill is a charge for specific service received, its amount depends upon the extent of that service, and the payment is one of the costs of manufacturing which with other costs is charged into the selling prices of the goods from which we estimate the factory's value product. If, then, we credit the freight to the value product of the railways, we must deduct it from the selling prices of the factory's output in getting what the

factory itself contributes to the National Income. If we did not make this deduction we should be counting the freight twice in our estimate, once explicitly under the caption "railways," and once tacitly under the caption "manufactures."

Now some taxes are levied in such a way as to put them for present purposes into the same position as freight charges. A cigar maker, a theater, a sleeping-car company, a manufacturer of cosmetics, all pay special taxes which they add to the prices of their products and later pay over to a Collector of Internal Revenue, just as definitely as a brick-yard adds freight charges to the price of brick and pays them over to a railway. By imposing these taxes the government does not add to the commodities and services which the tax-paying enterprises contribute to the National Income—indeed, the tax usually reduces the quantity of goods sold while increasing their aggregate selling value. If, now, we credit to government whatever service it provides out of the receipts from these taxes, we must deduct the taxes from the value products of the industries concerned. Otherwise we shall imply that the tax increased the value products of the industries concerned and also added to the value product of government. What the tax yielded would be counted twice.

Next take the precisely opposite case—a tax which the payer cannot add even in part to the selling prices of his products. Suppose that a given establishment pays no tax this year, and has a value product of $100,000, of which profits form $10,000. Next year this establishment turns out the same physical product at the same expense and sells it at the same price, but pays a tax of $1,000, which the government uses to employ an additional school teacher. Profits are cut down by this tax, but the establishment's contribution to the National Income is not diminished in physical quantity or in commercial value. Why then should we reduce our estimate of the establishment's value product by deducting the tax?

Yet, is not the tax counted twice if we do not deduct it? Our establishment is credited with its old value product; and part of this value product, by passing through the government's hands, has become an additional value product—education. Does not this imply that the government can increase the National Income at will by imposing taxes that cannot be shifted to consumers? This objection loses its plausibility when we ask what would have become of the $1,000 if the government had not taken it. If the establishment had kept the money in the business and bought new office

equipment, the makers of desks and waste baskets would have shown a larger value product than they show when the tax is collected and spent on schooling. Or if the tax money had been paid out in dividends and spent by the stockholders on clothing, gasoline, theaters and traveling, then the industries that cater to these demands would have shown larger value products. The imposition of the tax does not increase or decrease the size of the National Income; it changes merely the proportions among the items which enter into the aggregate.[1]

But this theoretical decision, that taxes which are added to selling prices should, and that taxes which are not added should not, be deducted from the value products of the industries taxed, does not solve the statistical problems involved in the Estimate by Sources of Production; for we don't know definitely what parts of the taxes imposed on business enterprises are shifted and what parts are not. There is wide difference of opinion, for example, concerning the extent to which the excess-profits taxes have been added to the selling prices. This is another intricate problem into which we do not enter. The one conclusion we do

[1] A slightly different way of viewing the relation of taxes to industry is presented by Mr. King in Vol. II, Chap. 5.

draw is that in deducting taxes in all cases from the value products of industries our Estimate by Sources of Production errs on the side of understating the National Income.

No systematic deduction from the National Income is made in our estimates to cover depletion of natural resources. Doubtless this item is of considerable size as well as of peculiar interest. Part of the National Income annually consumed at present is won by exploiting forests, mines and soils whose gradual exhaustion threatens to reduce the National Income of future years. Present income, however, is not reduced by possible future lack except in so far as depletion of natural resources affects present methods of accounting; and such influences are reflected in the statistics on which our Estimates of value products are based. Of course there is inconsistency between careful provision for maintaining the efficiency of industrial equipment and carelessness about the depletion of forests, mineral deposits and soils. But this is an inconsistency of practice, which a faithful report upon current facts concerning income may note, but cannot alter. Depletion is allowed as a deduction in computing taxable net income, and in the case of lumber, mining, and oil companies we have competent author-

ity for believing that since 1916 at least, the deductions made exceed, rather than understate, the actual amount of depletion. This opinion is based on the effects of the higher rates of taxation, and the fact that audits of returns have in many cases increased the reported taxable income. But careful accounting on this head is far from universal among corporations in extractive industries, and it is almost non-existent among those farmers who are "robbing the soil." As in other cases, few of the data are in such shape that we can get from them just what we wish.

Following common practice once more, we do not count as part of the National Income anything for which a price is commonly not paid. On this score we omit several of the most important factors in social well-being, above all the services of housewives to their families. Two awkward results follow from the exclusion. (1) Comparisons are thrown askew between communities or classes which differ widely in the proportion of women who work at home and women who work for wages. "For example, if we suppose that in one country one million wives remain at home and one million women work in industry, and there are no domestic servants, the total 'income' will differ from that of a country where half the 'wives' work

in industry and half the other women are domestic servants in the homes of the absent wives, despite the fact that the total 'work' being done is the same in both cases.''[1] (2) As decade by decade housewives buy more commodities and services which their mothers produced at home and themselves seek outside employment at a money wage, the range of goods not commonly paid for in money gradually shrinks. Hence figures such as we get for the National Income in successive years tend to exaggerate the increase in economic welfare. This exaggeration is probably slight within most periods as short as that covered here. It may have been appreciable, however, during the recent war, because of the special inducements then held out to women to enter money-making employment.

Statistically this is much the largest of the items concerning whose proper treatment there is serious doubt. Dr. A. M. Edwards, one of the best authorities on occupation statistics, estimates that in 1910 there were perhaps 18,000,000 American women, 16 years of age and over, engaged in housework in their own homes without monetary remuneration. If the proportion of such house-

[1] Sir Josiah Stamp, ''The Wealth and Income of the Chief Powers,'' *Journal of the Royal Statistical Society*, July, 1919, pp. 447, 448.

wives to the total population remained constant, their number had increased to 20,700,000 by January 1, 1920. How much was their contribution to the National Income worth, on the average? As much as the average pay of domestic servants? Somewhat more? Perhaps $500 per annum before the war, and more than that after servants' wages rose? We do not know. But to indicate the order of magnitude involved we show in Table 7

TABLE 7

CONJECTURAL ESTIMATE OF THE MONEY VALUE OF HOUSEWIVES' SERVICES ON THE ASSUMPTION THAT SUCH SERVICES WERE WORTH $500 PER ANNUM ON THE AVERAGE IN 1909 AND ROSE IN VALUE WITH THE ADVANCE IN WAGES[1]

| Year | Estimated Number of Housewives | Assumed Average Value of Housewives' Services | Conjectural Total Value of Housewives' Services |
|---|---|---|---|
| | In Millions | In Dollars | Billions of Dollars |
| 1909 | 17.7 | $500 | $ 8.85 |
| 1910 | 18.0 | 500 | 9.00 |
| 1911 | 18.4 | 500 | 9.20 |
| 1912 | 18.7 | 525 | 9.82 |
| 1913 | 19.0 | 525 | 9.98 |
| 1914 | 19.4 | 525 | 10.19 |
| 1915 | 19.7 | 550 | 10.84 |
| 1916 | 19.9 | 600 | 11.94 |
| 1917 | 20.2 | 650 | 14.30 |
| 1918 | 20.4 | 750 | 15.30 |
| 1919 | 20.5 | 900 | 18.45 |

[1] The number of housewives is based on Dr. Edward's rough approximation for 1910, on the assumption that this number varied as the total population, and on Mr. King's estimate of the total population in inter-censal years. The assumed average value of their services corresponds with Mr. Knauth's estimate of the average incomes of persons engaged in "Domestic and Personal Service"—a group that includes many other occupations besides female domestics.

what the aggregate value contributed to the National Income by this group of workers would amount to if we credited them with an average production of $500 in 1909 and raised this figure with the advance of wages.

These figures are of the sort that anyone can alter to suit himself. Anyone who so desires can add some such magnitudes as those given in the last column to the National Income as reported in the Estimate by Sources of Production or in the Estimate by Incomes Received.

### V. FINAL ESTIMATE OF THE SIZE OF THE NATIONAL INCOME

Understanding the term in the sense explained in the preceding section, we can now use our two estimates to make a final set of results showing the most probable size of the National Income and the margin of error to which these figures are subject. In so doing ought we simply to "split the difference" between the two estimates, or is one more reliable than the other?

To answer this question, Mr. King went over the Estimate by Sources of Production item by item and made a conjectural estimate of the probable error of each in millions of dollars; that is, he gets for each item a range within which

he thought the truth was equally likely to lie or not to lie. Mr. Knauth did the same with the Estimate by Incomes Received. Finally, the probable error of the aggregates for each year was computed in the usual manner by squaring these estimated errors, adding the squares and extracting the square root of the sum. This figure was then expressed as a percentage of the total National Income. This process gives the correct probable error of the total on the assumptions (1) that the probable errors assigned to the individual items are valid, and (2) that the errors of these items are not correlated with each other—in other words, that there is no more tendency for an over-estimate in one item to be accompanied by over-estimates in other items than for it to be accompanied by under-estimates; and (3) that the errors would tend to be distributed in a "normal" manner. Regarding the validity of the first assumption, we have no objective basis for judging whether either investigator overrated or underrated the accuracy of his approximations. Regarding the second assumption we are inclined to believe that there is a slight positive correlation among some of the errors. If so, the "probable errors" of the National Income as computed by the standard formula are rather too low. To get a contrasting

figure, we have gone to the opposite extreme and supposed that the errors in each estimate all run in the same direction, so that there is no canceling of errors in the totals. That is, we have added the estimated "probable errors" assigned to the several items and reduced the sums to percentages of the National Income.

One other explanation: Mr. Knauth's data for estimating incomes over $2,000 have improved in marked degree since 1910, first because of the imposition of the income tax in 1913; second because the administration of the tax grew more efficient as experience accumulated; third because the tax exemption limit was reduced in 1917 from $3,000 to $2,000; and finally because an "intensive drive" was begun in 1918 to increase the reporting of small taxable incomes. Certain of his other data also varied in quantity or quality from year to year, these variations in part counteracting the fairly steady improvement in the income tax figures. No such marked change has occurred in the character of Mr. King's data for sources of production. He believes that his totals are somewhat better in 1909 and 1914 than in other years because census data are more abundant then, as they presently will be for 1919. Another good year is 1916, be-

cause it affords the base for estimating profits in unclassified industries. But these differences are not great and definite enough to make profitable a year-by-year estimate of probable errors. Hence, Mr. King has computed the errors of the Estimate by Sources of Production only for 1918, which is not one of his strongest years, while Mr. Knauth has made the computation for each year separately.

Table 8 gives the figures thus arrived at. In 1918, there is little to choose between the probable errors yielded by the standard formula. They are

TABLE 8

MARGINS OF ERROR IN THE TWO ESTIMATES OF THE NATIONAL INCOME [EXPRESSED AS PERCENTAGES OF THE TOTALS]

1910-1918

(See text for explanation)

| Year | Estimate by Sources of Production | | Estimate by Incomes Received | |
|---|---|---|---|---|
| | Square roots of sums of squares of estimated probable errors in individual items | Sums of the estimated probable errors in the individual items | Square roots of sums of squares of estimated probable errors in individual items | Sums of the estimated probable errors in the individual items |
| 1910 | | | 3.8% | 6.6% |
| 1911 | | | 4.0% | 6.9% |
| 1912 | | | 3.9% | 6.8% |
| 1913 | | | 3.9% | 6.8% |
| 1914 | | | 4.0% | 6.9% |
| 1915 | | | 3.5% | 6.3% |
| 1916 | | | 3.0% | 5.3% |
| 1917 | | | 2.8% | 4.9% |
| 1918 | 2.1% | 8.5% | 2.5% | 4.5% |

remarkably low in both estimates, yet perhaps not smaller than the 2.1 per cent. difference between the two totals in this year prepares one to find. Indeed a glance back at Table 1 reminds us that the two series have differed by more than 2.5 per cent. only in 1912, 1913, and 1914, and that the maximum difference is 6.9 per cent. in 1913.

In making our final estimate of the most probable size of the National Income, we shall not indulge in statistical finesse, but shall simply split the difference between the two estimates. Table 9 shows the results reached in this way. We think

TABLE 9

FINAL ESTIMATE OF THE NATIONAL INCOME AND THE LIMITS WITHIN WHICH THE TRUE VALUES PROBABLY FALL

1909-1918

(For Explanations, See Text)

(In Billions of Dollars)

| Year | Ten per cent. less than the final estimate | Five per cent. less than the final estimate | Final estimate of the National Income | Five per cent. more than the final estimate | Ten per cent. more than the final estimate |
|---|---|---|---|---|---|
| 1909 | $25.9 | $27.4 | $28.8 | $30.2 | $31.7 |
| 1910 | 28.3 | 29.8 | 31.4 | 33.0 | 34.5 |
| 1911 | 28.1 | 29.6 | 31.2 | 32.8 | 34.3 |
| 1912 | 29.7 | 31.4 | 33.0 | 34.6 | 36.3 |
| 1913 | 31.0 | 32.7 | 34.4 | 36.1 | 37.8 |
| 1914 | 29.9 | 31.5 | 33.2 | 34.9 | 36.5 |
| 1915 | 32.4 | 34.2 | 36.0 | 37.8 | 39.6 |
| 1916 | 40.9 | 43.1 | 45.4 | 47.7 | 49.9 |
| 1917 | 48.5 | 51.2 | 53.9 | 56.6 | 59.3 |
| 1918 | 54.9 | 57.9 | 61.0 | 64.1 | 67.1 |

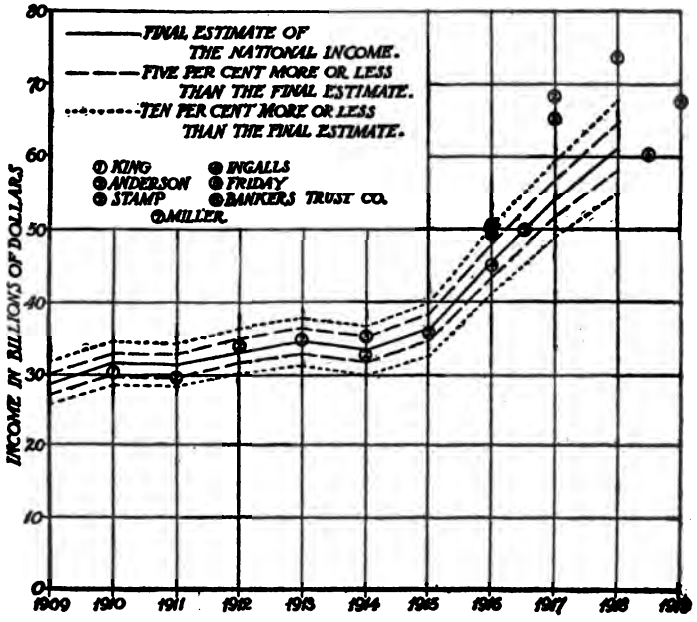
we are conservative in believing that these figures are probably accurate within 5 per cent., and we think it unlikely that the error in any year exceeds

CHART 12.

THE FINAL ESTIMATE OF THE NATIONAL INCOME AND ESTIMATES BY OTHER INVESTIGATORS.

1909-1919.

Based upon Tables 9 and 10.




the 10 per cent. margins shown in the outside columns.

With these results, it is interesting to compare the Estimates of the National Income that have

TABLE 10

COMPARISON OF ESTIMATES OF THE NATIONAL INCOME MADE BY DIFFERENT INVESTIGATORS[1]

1909-1918

(In Billions of Dollars)

| Year | National Bureau of Economic Research | | | Anderson | Stamp | Ingalls | Friday | Bankers' Trust Company | Miller |
|---|---|---|---|---|---|---|---|---|---|
| | —10% | Final Estimate | +10% | | | | | | |
| 1909 | $25.9 | $28.8 | $31.7 | | | | | | |
| 1910 | 28.3 | 31.4 | 34.5 | 30.5 | | | | | |
| 1911 | 28.1 | 31.2 | 34.3 | 29.6 | | | | | |
| 1912 | 29.7 | 33.0 | 36.3 | 33.8 | | | | | |
| 1913 | 31.0 | 34.4 | 37.8 | 34.8 | | | | | |
| 1914 | 29.9 | 33.2 | 36.5 | 32.6 | $35.3 | | | | |
| 1915 | 32.4 | 36.0 | 39.6 | 35.4 | | | | | |
| 1916 | 40.9 | 45.4 | 49.9 | 49.2 | | $44.9 | | $50.0 | |
| 1916-17 | (44.7) | (49.6) | (54.6) | | | | | | $49.7 |
| 1917 | 48.5 | 53.9 | 59.3 | 68.6 | | | $65.5 | | |
| 1918 | 54.9 | 61.0 | 67.1 | 73.4 | | | | | |
| 1918-19 | | | | | | | | 60.1 | |
| 1919 | | | | 67.7 | | | | | |

[1] Dr. B. M. Anderson, Jr., extended Mr. King's estimate for 1910 (*Wealth and Income of the People of the United States*, 1915, p. 129) to cover 1911-16 by supposing the National Income to vary as an index made from railway gross earnings and prices. In 1917-19, he thought railway earnings less representative than in earlier years, and brought into his index various data for the amount of commodities produced or exchanged. For his results, see *New York Times Annalist*, Jan. 3, 1921, p. 9.

Sir Josiah Stamp's estimate for 1913 is also made by extending Mr. King's figure for 1910. See *Journal of the Royal Statistical Society*, July, 1919, p. 491.

Mr. W. R. Ingalls based his estimate for 1916 partly upon Mr. King's work, but used much fresh material. See *New York Times Annalist*, September 13, 1920, p. 323.

Professor David Friday's estimate also goes back to Mr. King's work, but includes a survey of additional data. See *Journal of Political Economy*, December, 1918, p. 956.

Dr. A. C. Miller's estimate for the year 1916-17 is cited in Professor Friday's article.

If the conjectural estimate of the value of housewives' services for which no money payment is made (see Table 7 above) be included, the "final estimate" of the National Income becomes:

| | (Billions of Dollars) |
|---|---|
| 1909 | 37.6 |
| 1910 | 40.4 |
| 1911 | 40.4 |
| 1912 | 42.8 |
| 1913 | 44.4 |
| 1914 | 43.4 |
| 1915 | 46.8 |
| 1916 | 57.3 |
| 1917 | 68.2 |
| 1918 | 76.3 |

TABLE 11

FINAL ESTIMATE OF THE NATIONAL INCOME PER CAPITA AND THE LIMITS WITHIN WHICH THE TRUE VALUES PROBABLY FALL

1909-1918

| Year | Population on June 30 (Millions) | Ten per cent. less than the final estimate | Five per cent. less than the final estimate | Final estimate of the National Income per capita | Five per cent. more than the final estimate | Ten per cent. more than the final estimate |
|---|---|---|---|---|---|---|
| | | (In Dollars per Annum) | | | | |
| 1909 | 90.37 | $287 | $303 | $319 | $335 | $351 |
| 1910 | 92.28 | 306 | 323 | 340 | 357 | 374 |
| 1911 | 93.81 | 300 | 316 | 333 | 350 | 366 |
| 1912 | 95.34 | 311 | 329 | 346 | 363 | 381 |
| 1913 | 97.28 | 319 | 336 | 354 | 372 | 389 |
| 1914 | 99.19 | 302 | 318 | 335 | 352 | 368 |
| 1915 | 100.43 | 322 | 340 | 358 | 376 | 394 |
| 1916 | 101.72 | 401 | 424 | 446 | 468 | 491 |
| 1917 | 103.06 | 471 | 497 | 523 | 549 | 575 |
| 1918 | 104.18 | 527 | 557 | 586 | 615 | 645 |

been made by other investigators for various years in our period. All the other estimates fall within 10 per cent. of our final estimates, except Professor Friday's estimate for 1917 and Dr. Anderson's estimates for 1917 and 1918.

Another interesting supplement to Table 9 is a reduction of the National Income to income per capita. The population figures used in this table are estimates for June 30th of the intercensal years made by Mr. King from census returns, vital statistics, and immigration records.

Once more, the reminder may be entered that Tables 9 and 10 and the charts drawn from them show income in dollars or billions of dollars, and that most of the apparent increase of income in the

war years is a monetary illusion. The next task is to see how much of the increase is left if we reduce our estimates to hypothetical dollars of constant purchasing power.

### VI. THE NATIONAL INCOME REDUCED TO PRE-WAR VALUES

To determine the best method of "deflating" our estimates of the National Income is a difficult problem. It will not do simply to divide the aggregate figures by such a series as the Bureau of Labor Statistics index number of prices at wholesale, because the great bulk of income is spent by families on retail purchases. Nor will it do to divide our aggregates by the same Bureau's index number of the cost of living, because these figures are made expressly to represent changes in this cost to families of small means, and our figures profess to represent all families. Some more elaborate method is necessary, and it is desirable to safeguard the results by using more than one method. Hence we have broken up both estimates into parts and applied appropriate index numbers to each part separately.

In making the Estimate by Sources of Production Mr. King subdivided the net product of

each industry into (1) sums paid to employees, (2) sums paid out in interest, dividends, rents, royalties, and profits, and (3) income not paid out but kept in the business. The first of these sums he "deflated" by using the Bureau of Labor Statistics index number of cost of living. For "deflating" the second sum, he used a new index number designed to show fluctuations in the living expenses of families having expenditures for consumption goods of $5,000 to $25,000 per year. To the third item, he applied an index number of construction costs. Since the details of this computation, as given in Volume II, are rather elaborate and since in another section, we shall present his statistics of the share of employees in the National Income, it will suffice here to give merely his final results. (See Table 13).

Mr. Knauth's method of "deflating" the Estimate by Incomes Received was somewhat different. He made a very rough estimate of the amounts of income "saved" each year by persons having incomes less than $2,000, and a similar estimate for persons having more than that amount. Of course, these "savings" are really spent. The two great objects on which savings were spent in 1914-1919 were new industrial equipment of all sorts, including houses, and the war. Accordingly,

the total savings, including those made by business enterprises, were divided, again very roughly, between those two uses. Thus Mr. Knauth converted his estimate of the National Income into an estimate of National Expenditures subdivided under four heads: (1) personal and family expenditures of people having incomes less than $2,000 per year; (2) similar expenditures of people having incomes above $2,000; (3) expenditures on construction of houses and industrial equipment; and (4) expenditures on the war. An index number was used for each of these headings as follows: (1) for incomes over $2,000, an index number computed by the Bureau; (2) for incomes under $2,000, the cost-of-living index number of the Bureau of Labor Statistics; (3) for construction,

TABLE 12

THE NATIONAL INCOME AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913, ACCORDING TO THE ESTIMATE BY INCOMES RECEIVED

| Year | National Income (Billion dollars) | Weighted Index Number of Prices | Purchasing Power at Price Level of 1913 (Billion dollars) |
|---|---|---|---|
| 1910 | $31.1 | 97.8 | $31.8 |
| 1911 | 31.2 | 98.5 | 31.7 |
| 1912 | 32.4 | 99.4 | 32.6 |
| 1913 | 33.3 | 100.0 | 33.3 |
| 1914 | 32.5 | 100.6 | 32.3 |
| 1915 | 35.9 | 102.5 | 35.0 |
| 1916 | 45.5 | 113.4 | 40.1 |
| 1917 | 53.9 | 136.1 | 39.6 |
| 1918 | 61.7 | 160.8 | 38.4 |
| 1919 | 66.0 | 176.8 | 37.3 |

an index number computed by the Statistical Division of The American Telephone and Telegraph Company; (4) for war expenditures, an index number based on the War Industries Board's His-

TABLE 13

THE NATIONAL INCOME AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913

1909-1919

In Billions of Dollars

| Year | National Income | | | Purchasing Power at Price Level of 1913 | | |
|---|---|---|---|---|---|---|
| | Estimate by Sources of Production | Estimate by Incomes Received | Final Estimate | Estimate by Sources of Production | Estimate by Incomes Received | Final Estimate |
| 1909 | $28.8 | | $28.8 | $30.1 | | $30.1 |
| 1910 | 31.6 | $31.1 | 31.4 | 32.5 | $31.6 | 32.2 |
| 1911 | 31.2 | 31.2 | 31.2 | 31.7 | 31.7 | 31.7 |
| 1912 | 33.6 | 32.4 | 33.0 | 33.7 | 32.6 | 33.2 |
| 1913 | 35.6 | 33.3 | 34.4 | 35.6 | 33.3 | 34.4 |
| 1914 | 33.9 | 32.5 | 33.2 | 33.6 | 32.3 | 33.0 |
| 1915 | 36.1 | 35.9 | 36.0 | 35.3 | 35.0 | 35.2 |
| 1916 | 45.4 | 45.5 | 45.4 | 41.3 | 40.1 | 40.7 |
| 1917 | 53.9 | 53.9 | 53.9 | 41.9 | 39.6 | 40.8 |
| 1918 | 60.4 | 61.7 | 61.0 | 39.1 | 38.4 | 38.8 |
| 1919 | | 66.0 | | | 37.3 | |
| | Relative Fluctuations: 1913 = 100 | | | | | |
| 1909 | 81 | | 84 | 85 | | 88 |
| 1910 | 89 | 93 | 91 | 91 | 95 | 94 |
| 1911 | 88 | 94 | 91 | 89 | 95 | 92 |
| 1912 | 94 | 97 | 96 | 95 | 98 | 97 |
| 1913 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914 | 95 | 98 | 97 | 94 | 97 | 96 |
| 1915 | 101 | 108 | 105 | 99 | 105 | 102 |
| 1916 | 128 | 137 | 132 | 116 | 120 | 118 |
| 1917 | 151 | 162 | 157 | 118 | 119 | 119 |
| 1918 | 170 | 185 | 177 | 110 | 115 | 113 |
| 1919 | | 198 | | | 112 | |

tory of Prices 1913-1918. These four series, appropriately weighted, were combined to make a final index number, which was applied to the aggregate National Income. The results are shown in Table 12.

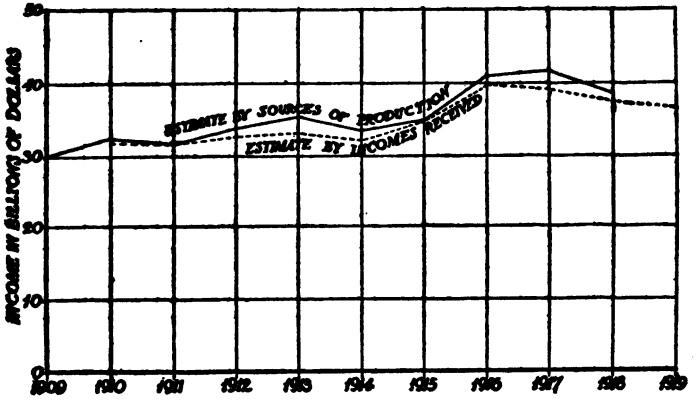
When these results are put beside Mr. King's, the two series are found once more to be in close agreement; how close is shown by Table 13 and Chart 13. Perhaps the most important discrep-

CHART 13.

THE TWO ESTIMATES OF THE PURCHASING POWER OF THE NATIONAL INCOME AT THE PRICE LEVEL OF 1913.

1909-1919.

Based upon Table 13.




ancy concerns the year when the National Income, considered not as a sum of money values, but as an aggregate of commodities and services which current money income would buy, reached its maximum. One estimate puts the maximum in 1916, the other in 1917. The final estimate, made by splitting the difference between Mr.

King's and Mr. Knauth's figures, gives the palm to 1917 by a slight margin.

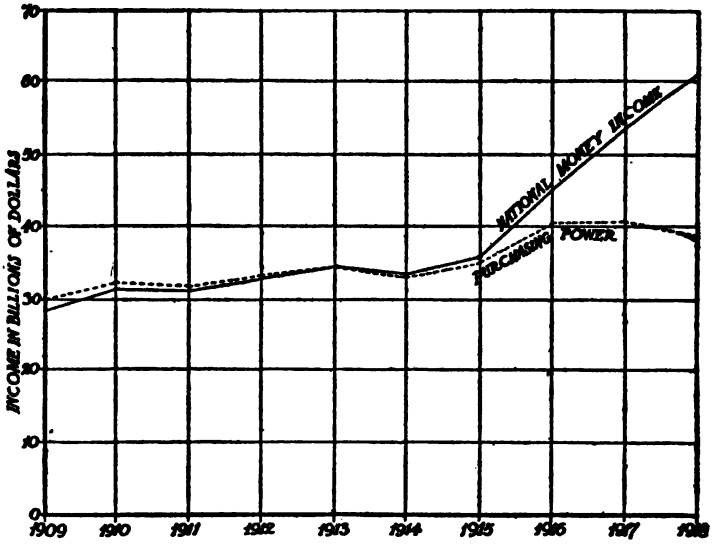
Both estimates make it clear that all of the ex-

CHART 14.

THE FINAL ESTIMATE OF THE NATIONAL INCOME AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913.

1909-1918.

Based upon Table 13.




traordinary gains in money income after the United States entered the war were due to fluctuations in prices. For even according to the Estimate by Sources of Production, the gain registered in 1917 over 1916 was by no means extraor-

dinary—not comparable for example with the gain made in 1912 over 1911. The conclusion to which the figures point is that large increases in

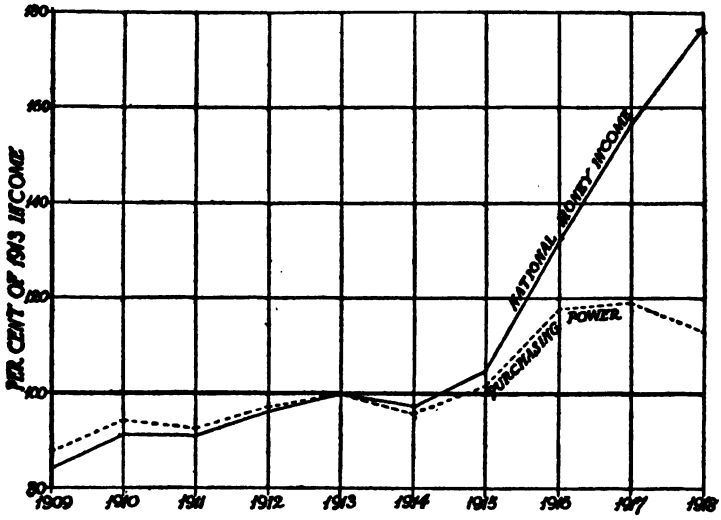
CHART 15.

RELATIVE FLUCTUATIONS IN THE FINAL ESTIMATE OF THE NATIONAL INCOME AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913.

1909-1918.

Amounts in 1913 = 100.

Based upon Table 13.




real National Income, if we may use that term to mean the serviceable goods available for use by the population, are due either to a marked improvement in the harvests, or to a marked increase in industrial activity, or to both of these changes

occurring simultaneously. From the dull year 1911 to the busy year 1912, and still more from the exceedingly depressed year 1914 to the exceedingly active year 1916, the gain is great. But once people are nearly all employed and

TABLE 14

THE FINAL ESTIMATE OF THE NATIONAL INCOME PER CAPITA AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913

1909-1918

| Year | Population in Millions | National Income | | Purchasing Power at Price Level of 1913 | |
|---|---|---|---|---|---|
| | | Income in Billion Dollars | Per Capita Income in Dollars | Income in Billion Dollars | Per Capita Income in Dollars |
| 1909 | 90.87 | $28.8 | $319 | $30.1 | $333 |
| 1910 | 92.28 | 31.4 | 340 | 32.2 | 349 |
| 1911 | 93.81 | 31.2 | 333 | 31.7 | 338 |
| 1912 | 95.34 | 33.0 | 346 | 33.2 | 348 |
| 1913 | 97.28 | 34.4 | 354 | 34.4 | 354 |
| 1914 | 99.19 | 33.2 | 335 | 33.0 | 333 |
| 1915 | 100.48 | 36.0 | 358 | 35.2 | 350 |
| 1916 | 101.72 | 45.4 | 446 | 40.7 | 400 |
| 1917 | 103.06 | 53.9 | 523 | 40.8 | 396 |
| 1918 | 104.18 | 61.0 | 586 | 38.8 | 372 |
| | | Relative Fluctuations: 1913 = 100 | | | |
| 1909 | 93 | 84 | 90 | 88 | 94 |
| 1910 | 95 | 91 | 96 | 94 | 99 |
| 1911 | 96 | 91 | 94 | 92 | 95 |
| 1912 | 98 | 96 | 98 | 97 | 98 |
| 1913 | 100 | 100 | 100 | 100 | 100 |
| 1914 | 102 | 97 | 95 | 96 | 94 |
| 1915 | 103 | 105 | 101 | 102 | 99 |
| 1916 | 105 | 132 | 126 | 118 | 113 |
| 1917 | 106 | 157 | 148 | 119 | 112 |
| 1918 | 107 | 177 | 166 | 113 | 105 |

the factories and workshops, the mines and railways, the ships and shops are used at full capacity, further increases of output slow down to the rate made possible by current increase of population, development of natural resources, construction of new equipment, and

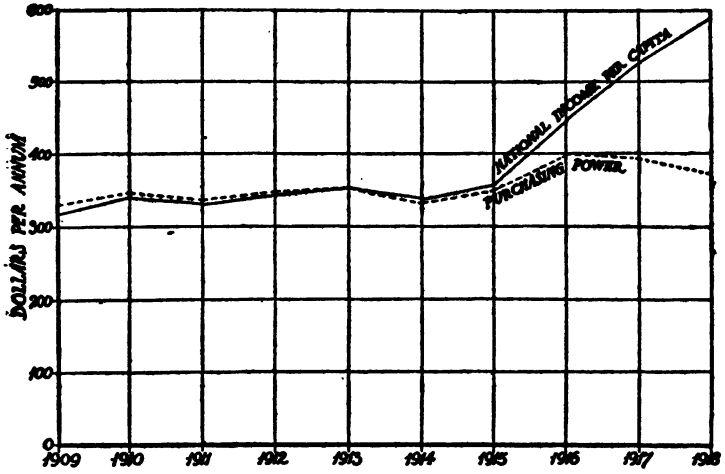
improvement in methods. And when a large number of the most effective workers are withdrawn from industry, as they were in 1918, it is difficult if not impossible to prevent production in

CHART 16.

THE FINAL ESTIMATE OF THE INCOME PER CAPITA AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913.

1909-1918.

Based upon Table 14.




physical terms from falling off, however large a money premium is offered for intense effort.

In some respects, the per capita figures of Table 14 are more significant than the national aggregates of Table 13. These per capita figures of course increase at a slower rate in good years,

and fall off at a faster rate in bad years than do the aggregates from which they are computed. When the data are cast into this shape, the decline

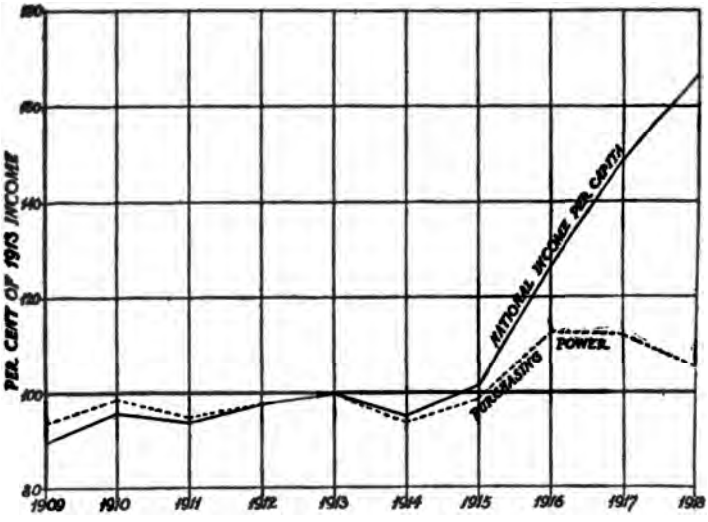
CHART 17.

RELATIVE FLUCTUATIONS IN THE FINAL ESTIMATE OF THE INCOME PER CAPITA AND ITS PURCHASING POWER AT THE PRICE LEVEL OF 1913.

1909-1918.

Amounts in 1913 = 100.

Based upon Table 14.




in real National Income during American participation in the war becomes rather marked. The economic prosperity of 1919 was an illusion so far as current production of serviceable goods is concerned.

It is interesting to compare these new figures for National Income in money of constant purchasing power with the index numbers of the physical volume of production which have re-

TABLE 15

COMPARISON OF THE FLUCTUATIONS IN THE FINAL ESTIMATE OF THE PURCHASING POWER OF THE NATIONAL INCOME AT THE PRICE LEVEL OF 1913 WITH FOUR INDEX NUMBERS OF THE PHYSICAL VOLUME OF PRODUCTION

1909-1919

Amounts in 1913 = 100

| Year | Relative Purchasing Power of the National Income at the Price Level of 1913 | | | Index Numbers of Physical Volume of Production, Compiled by | | | |
|---|---|---|---|---|---|---|---|
| | Estimate by Sources of Production | Estimate by Incomes Received | Final Estimate | E. E. Day (1) | W. W. Stewart (2) | Carl Snyder (3) | W. I. King (4) |
| 1909 | 85 | | | | | | |
| 1910 | 91 | 95 | 94 | 98 | 95 | 91 | 89 |
| 1911 | 89 | 95 | 92 | 89 | 92 | 90 | 88 |
| 1912 | 95 | 98 | 97 | 102 | 105 | 97 | 95 |
| 1913 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1914 | 94 | 97 | 96 | 98 | 100 | 97 | 96 |
| 1915 | 99 | 105 | 102 | 105 | 111 | 104 | 106 |
| 1916 | 116 | 120 | 118 | 111 | 116 | 118 | 126 |
| 1917 | 118 | 119 | 119 | 114 | 128 | 125 | 119 |
| 1918 | 110 | 115 | 113 | 113 | 124 | 129 | 113 |
| 1919 | | 112 | | 107 | 119 | 116 | 110 |

(1) *Review of Economic Statistics*, Harvard University Committee on Economic Research, Vol. 3, No. 1, January, 1921, p. 20. Weighted according to values in 1909. Includes 90 Farm Products, 10 Minerals and 88 Products of Manufactures.
(2) *American Economic Review*, March, 1921. Includes 91 products.
(3) These figures have not been published. Include 87 commodities.
(4) *Bankers' Statistics Corporation*, Special Service, Vol. 2, No. 12, August 24, 1920.

cently been made by four statisticians working independently of each other. It will be seen from Table 15 that the two estimates of the National Income in money of constant purchasing power fluctuate in closer harmony with each other than

do any two of the index numbers of physical volume of production. And from Chart 18, it appears clearly that these two estimates, or rather

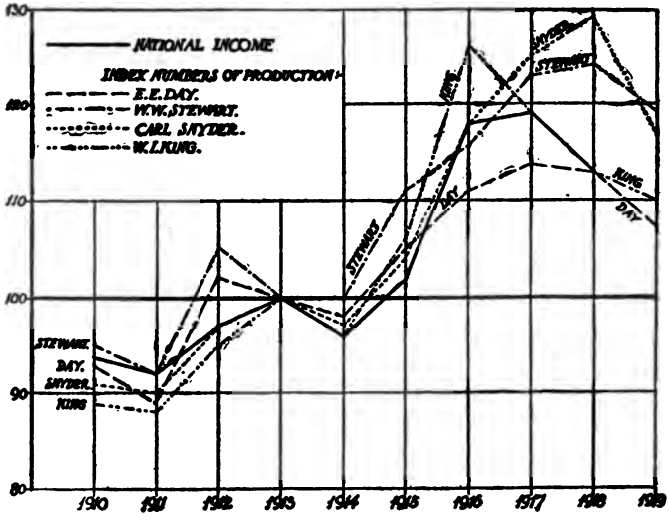
CHART 18.

COMPARISON OF THE FLUCTUATIONS IN THE FINAL ESTIMATE OF THE PURCHASING POWER OF THE NATIONAL INCOME AT THE PRICE LEVEL OF 1913, WITH FOUR INDEX NUMBERS OF THE PHYSICAL VOLUME OF PRODUCTION.

1910-1919.

Amounts in 1913 = 100.

Based upon Table 15.




the "final estimate" made from them, pursues an intermediate course through the field covered by the fluctuations of the physical-production index numbers. This comparison affords a further

indication that our results are substantially trustworthy.

### VII. TOTAL AND PER CAPITA INCOME IN DIFFERENT COUNTRIES

In 1919, Sir Josiah Stamp, one of the highest British authorities on income statistics, made a careful survey of all recent investigations into the wealth and income of the chief powers, and assembled his results in a summary table published in the *Journal of the Royal Statistical Society*.[1] He used the year 1914 as base, because that year "at the outbreak of war, represents the latest date for which satisfactory statistics are generally available," and he graded the estimates for the several countries according to his estimate of their approximate accuracy.

This work makes it easy to compare our final estimate of the National Income of the United States in 1914 with the best estimates for other countries. In reproducing Sir Josiah Stamp's table, we have made but three changes. (1) Pounds sterling are converted into dollars at their pre-war value. (2) The new estimate for the United States made by this Bureau is substituted for Sir Josiah's continuation of Mr. King's 1910

[1] See the issue for July, 1919, Vol. LXXXII, pp. 441-507. The table is on p. 491.

figure. (3) This new American figure is put in Grade I instead of Grade II. Concerning Mr. King's former figure, Sir Josiah Stamp remarked, "As the estimate stands, unchecked by any taxation data, it is in the second grade, but after the lapse of a few years, such statistics should be available from the recently instituted income tax as to make a much closer estimate possible."[1] We think that time has come.

The British estimate was made by Professor A. L. Bowley with a free use of materials drawn from Sir Josiah Stamp's *British Incomes.* It rests primarily upon income-tax returns, which include all incomes above £160 ($800) per year, and upon census data regarding wages and number of persons following gainful occupations. This estimate Sir Josiah regards "as perhaps the most accurate available for any country." The source of the German estimate is *Deutschland's Volkswohlstand,* 1888-1913, by Dr. Helfferich, director of the Deutsche Bank. Dr. Helfferich used the Prussian income-tax data—which include incomes as low as 900 marks ($225),—supplemented by estimates for evasion, which he puts at 10 per cent., and incomes of untaxed individuals

[1] See *Journal of the Royal Statistical Society* for July, 1919, Vol. LXXXII, p. 462.

whom he credits with an average of 750 marks ($188), per year. These Prussian figures he applies to the whole German Empire and gets a total which Sir Josiah Stamp thinks may be 6 per cent. too high or 9 per cent. too low. The French authority is René Pupin, *La Richesse de la France devant la Guerre,* 1916. Lacking income-tax data, M. Pupin made an estimate by sources of production. The main sources he distinguished are property in real estate, buildings, securities and banks, "the effort" of people employed in various industries, and "capital and labor" engaged in farming, business and the liberal professions. His results are supposed to be subject to an error of more than 10 but less than 20 per cent. Italian statistics of income are very weak. The figure used here is a current guess adopted by Professor E. L. Bogart in his book on *The Direct Costs of the Present War,* and is thought liable to an error which may exceed 40 per cent. The Austro-Hungarian estimate is another guess adopted in default of better figures by Professor Bogart. For Spain a rough approximation has been made by André Barthe from such data as he could collect concerning income from property, wages, salaries, and profits. The Australian figures are taken from the War Census of 1915, when all persons over 18 years of age were

required to report the amount of their property and incomes,—an undertaking which constitutes "perhaps the most thorough and complete attempt that has yet been made to ascertain national wealth." The Canadian figure rests on a "guess" made by Sir Robert Giffen in 1903 and may well be far from the truth. Finally, Sir Josiah Stamp himself made the Japanese estimate from income-tax returns, plus a large allowance for evasion, and an average income of about $120 per year for the 8,500,000 families belonging to the "lower classes."

From this review, it will be seen that the United States is the only country for which estimates have been made on the basis both of sources of production and of incomes received. It is true that the American income-tax figures are less satisfactory than the British or Prussian, because of their relatively high exemption limit—$3,000 for married people in 1914 as against $800 in the United Kingdom and $225 in Prussia—and because the administration of the law certainly had not then and probably has not yet attained as high a degree of efficiency as in countries where similar taxes have been long in operation. For example, in 1911 the number of persons assessed under the income tax in Great Britain was estimated (the

complicated scheme of schedules makes impossible an accurate determination) at 5.7 per cent. of all persons having gainful occupations;[1] in the United States the corresponding figures for 1913, 1914 and 1915 were none of them quite one per

TABLE 16

SUMMARY SHOWING THE ESTIMATED NATIONAL AND PER CAPITA INCOME OF VARIOUS COUNTRIES AT THE OUTBREAK OF WAR IN 1914, AND THE APPROXIMATE ACCURACY OF THE RESPECTIVE ESTIMATES

Adapted from the Summary by Sir Josiah Stamp, *Journal of the Royal Statistical Society*, July, 1919

| Country | Estimates based upon the work of | Approximate Accuracy; Grade[a] | National Income, Millions of Dollars | Per Capita Income, Dollars |
|---|---|---|---|---|
| United States | National Bureau of Economic Research | I | $33,200 | $335 |
| United Kingdom | Bowley, Stamp | I | 10,950 | 248 |
| Germany | Helfferich | I | 10,460 | 146 |
| France | Pupin | II | 7,300 | 185 |
| Italy | | IV | 3,890 | 112 |
| Austria-Hungary | | IV | 5,350 | 102 |
| Spain | Barthe | IV | 1,120 | 54 |
| Australia | Official, Knibbs | I | 1,260 | 368 |
| Canada | Giffen | IV | 1,480 | 195 |
| Japan | Stamp | III | 1,580 | 29 |

I. Estimate is not likely to be inaccurate to a greater extent than 10 per cent.
" II. Estimate is not likely to be inaccurate to a greater extent than 20 per cent.
" III. Estimate is not likely to be inaccurate to a greater extent than 30 per cent.
" IV. Estimate may be inaccurate to a greater extent than 40 per cent.

cent. Still the remarkable agreement between the Bureau's two American estimates made independently of each other gives one considerable confidence in their approximate accuracy even in 1914. It may be added that, since then, the American income-tax data have become relatively more

[1] Compare A. L. Bowley, *The Division of the Product of Industry* (1919), pp. 10, 11.

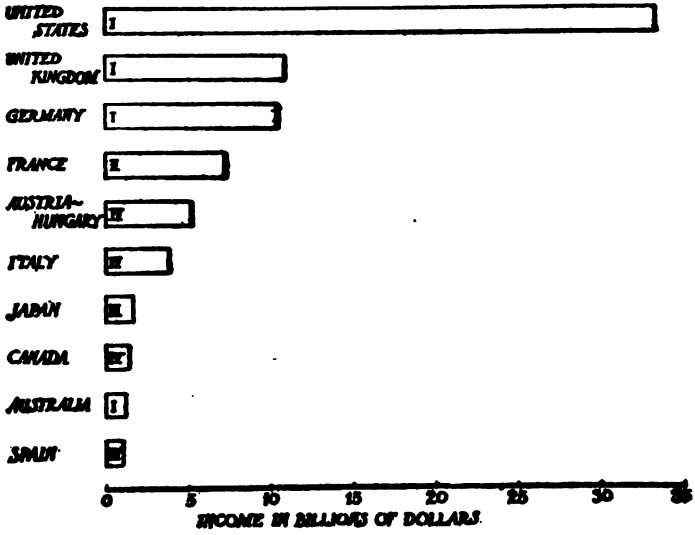
inclusive than were the British data before the war. By 1918, the reduction in the exemption limit, the increase in money incomes, and improve-

CHART 19.

THE ESTIMATED NATIONAL INCOME OF VARIOUS COUNTRIES IN 1914.

Approximate accuracy of estimates indicated by grade numbers I to IV.

Based upon Table 16.




ments in administration had raised the number of persons reporting incomes over $2,000 to more than 7 per cent. of all persons gainfully employed.[1]

[1] If the returns between one and two thousand dollars be counted in, nearly 11 per cent. of all personal incomes are included in the Internal Revenue Bureau's tables. But these statistics for the lowest income class have little value for estimating National Income, because they are limited to single persons, and married people who do not live together.

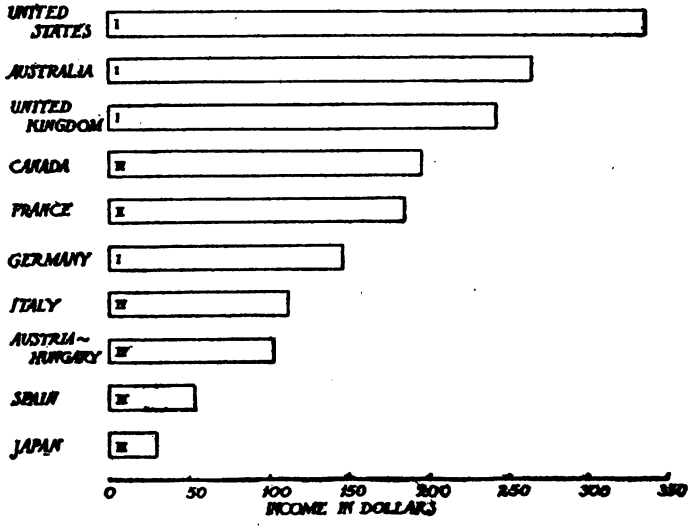
Concerning the facts brought out by these international comparisons, nothing need be added to Sir Josiah Stamp's brief commentary: "I may

CHART 20.

THE ESTIMATED INCOME PER CAPITA OF VARIOUS COUNTRIES IN 1914.

Approximate accuracy of estimates indicated by grade numbers I to IV.

Based upon Table 16.




perhaps remark," he said, "that the generally higher level of pre-war prices in America (which is reflected in the per capita average) cannot discount the immense absolute lead of the States in real wealth, or the rapidity of its increase. The

difference between the United Kingdom and Germany is not so considerable as other writers have suggested, and the effects of the well-known thrift of the French nation are apparent. The Japanese are making immense strides, but over 60 per cent. of their population are engaged in agriculture, and live on an amount per head which would be impossible in Europe—indeed, a comparison with this leading Eastern nation's figures brings out" the fundamental difficulty of comparing the incomes of peoples whose scales of value are radically unlike.[1]

[1] *Journal of the Royal Statistical Society*, July, 1919, p. 490.

## CHAPTER 3

## THE DISTRIBUTION OF THE NATIONAL INCOME

The data from which Mr. King made the Estimate by Sources of Production enabled him to divide the value product of each industry into two parts: first, payments to employees; second, interest and rent payments to individuals, and profits. Similarly, the income-tax exemption limit led Mr. Knauth to divide the Estimate by Incomes Received into two parts: incomes over, and incomes under, $2,000. Both these divisions possess interest, and together they form a good introduction to the rather technical study of the distribution of all incomes among persons which has been made by Mr. Macaulay.

### I. THE SHARE OF EMPLOYEES IN THE NATIONAL INCOME

The percentage of the value product of an industry paid to *employees* for their services is not at all the same thing as what is sometimes referred to as the "share of labor" in the product

of that industry. For there is a great deal of work done that is paid for not in the form of agreed-upon wages or salary but rather in the form of profits (often referred to by economists as the "wages of management.") To determine the "share of labor" in the product of agriculture, for example, one would have not only to find the wages paid farm hands but also to split up the farmers' own incomes into return for their labor and return for their land and capital. That task would involve some hypothetical division of a sum that is really not divisible. One can compute a farmer's "labor income" by supposing that it is the balance of his income left after setting aside the average rate of interest (whatever that may be) upon the value of his investment (if that can be ascertained). Or, one can compute what profits a farmer makes by supposing that the profit is the balance of his income left after setting aside average wages (whatever they may be) for all the work he does (if one can find out how much he works). The first computation as usually carried out shows that the farmer gets very low wages. The second computation usually shows that he makes very small profits. Results equally enlightening might be produced by applying methods equally hypothetical to the incomes of

shopkeepers, repair men, and the many other occupations conducted on a modest scale by men working on their own account.

This task Mr. King has not essayed. But among the facts best known to most business men and easiest to estimate as a whole are the facts concerning the aggregate pay roll, including salaries as well as wages. There is nothing hypothetical about these figures, and their accuracy is subject to a margin of error probably no wider in the majority of cases, and in many cases narrower than the margin of error in the estimate of the net value product of the industry. To the pay roll can be added pensions, compensation for accidents and any other payments made to employees—a figure that is less accurate but of minor size. The sum, to repeat, will not be the "share of labor", but only the share of *hired* labor, received in the form of wages, pensions, and compensation for accidents.

Such figures, cast into the form of percentages of the net value products, are presented in Table 17 for the main industrial groups recognized in the Estimate by Sources of Production.

The striking fact brought out by this table is the marked inequality of the percentages for different industries. The share of hired labor is very low

TABLE 17

## PERCENTAGES OF THE NET VALUE PRODUCT OF VARIOUS INDUSTRIES RECEIVED BY EMPLOYEES, IN THE FORM OF PAYMENT FOR SERVICES

1909-1918

NOTE:—These figures show merely the share of *hired* labor of all grades (received as wages, salaries, pensions, compensation for accidents and the like) in the *net value product* of the several industries. The net value product does not include raw materials, supplies or services received from other industries. These figures do *not* show the "share of labor" in industry or in the national income; neither do they show the total incomes of employees, many of whom have other sources of income besides their wages or salaries.

| Year | All Industries | Agriculture[1] | Production of Minerals | Manufacturing | |
|---|---|---|---|---|---|
| | | | | Factories[2] | Hand Trades[3] |
| 1909 | 53.0 | 15.3 | 71.0 | 72.2 | 57.3 |
| 1910 | 52.2 | 12.5 | 73.7 | 71.6 | 58.9 |
| 1911 | 53.9 | 14.1 | 73.8 | 76.4 | 58.6 |
| 1912 | 54.9 | 14.4 | 71.4 | 74.5 | 59.3 |
| 1913 | 55.6 | 13.4 | 73.4 | 74.5 | 66.7 |
| 1914 | 54.7 | 12.7 | 72.7 | 77.8 | 58.9 |
| 1915 | 53.6 | 12.3 | 67.4 | 75.4 | 58.7 |
| 1916 | 51.9 | 11.7 | 60.9 | 68.7 | 57.8 |
| 1917 | 51.6 | 10.9 | 63.1 | 71.0 | 61.6 |
| 1918 | 54.0 | 9.9 | 70.6 | 78.1 | 59.6 |

| | Transportation | | | Banking | Government[4] | Unclassified Industries |
|---|---|---|---|---|---|---|
| | Railway, Express, Sleeping-Car, Switching and Terminal Companies | Street Railway, Electric Light and Power, Telegraph and Telephone Companies | Transportation by Water | | | |
| 1909 | 59.6 | 50.4 | 83.5 | 26.6 | 93.3 | 60.4 |
| 1910 | 60.3 | 50.7 | 75.0 | 24.3 | 92.2 | 61.7 |
| 1911 | 62.8 | 51.5 | 81.7 | 26.5 | 91.6 | 61.9 |
| 1912 | 64.2 | 51.7 | 77.7 | 28.6 | 91.7 | 62.6 |
| 1913 | 66.4 | 52.9 | 79.1 | 31.6 | 91.7 | 63.2 |
| 1914 | 66.3 | 53.2 | 85.6 | 31.9 | 91.6 | 63.3 |
| 1915 | 61.5 | 51.1 | 79.2 | 34.5 | 91.3 | 62.0 |
| 1916 | 60.9 | 52.5 | 72.2 | 35.5 | 91.4 | 56.8 |
| 1917 | 67.4 | 55.4 | 79.1 | 34.8 | 90.8 | 52.6 |
| 1918 | 78.2 | 62.8 | 83.2 | 36.7 | 90.5 | 52.5 |

[1] Includes stock raising, market gardening, etc.
[2] Includes lumbering and shipbuilding.
[3] Includes building and construction other than shipbuilding.
[4] Includes schools and government-operated enterprises under state and local as well as national governments.

in agriculture (about one-eighth of the value product on the average) because the farmer and his family do so much of their own work. It is low also

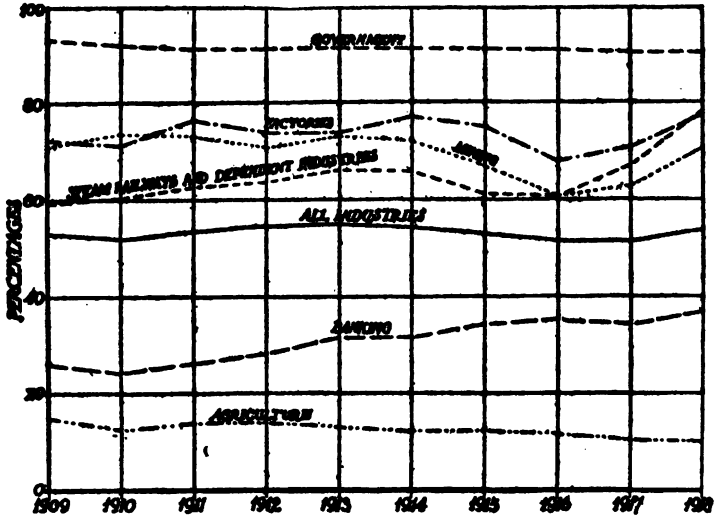
CHART 21.

PERCENTAGES OF THE NET VALUE PRODUCT OF VARIOUS INDUSTRIES RECEIVED BY EMPLOYEES IN THE FORM OF PAYMENT FOR SERVICES.

1909-1918.

NOTE: These percentages show neither the "share of labor" in the value product nor the total income of employees.

Based upon Table 17.




in banking (from a third to a half of the total) for a very different reason. Here most of the labor is hired, but the amount of work required is small in comparison with the capital invested. Then come the hand trades which are a little like farm-

ing in the proportion of labor paid by profits to labor paid by wages, and local public utilities which are somewhat like banking in the proportion of capital invested to labor required. In mining, manufacturing, water transportation, and government work, the percentages oscillate about points not far from three-quarters of the total. For all industries combined, the proportion of the product paid to employees is kept down to slightly more than half of the total by the great importance of farming with its exceptionally low percentage.

Another very interesting set of conclusions may be drawn from the year-to-year changes in these percentages. Except in banking and government work, which present obvious peculiarities, the percentage of the net product going to employees fell between 1914 and 1916 and rose again between 1916 and 1918 (except in farming). The rapid rise of prices in the first period redounded immediately to the benefit of profit-makers. Wages lagged far behind prices in their rise; but they began to rise rapidly and the number of persons employed increased largely after the advance of prices had slowed down. The net result was that, by 1918, the employees in most industries were getting as large a slice of the product as before the war, and in some cases a decidedly larger slice.

Their net gains were particularly noticeable in rail transportation, in local public utilities, in banking and in government work. The percentage for all industries in 1918 stands just a shade higher than in 1909, though not so high as in 1913.

Table 17 shows, then, that a little more than half the total National Income is paid in the form of wages, salaries and the like to hired labor; that this share varies widely from one industry to another with the elaborateness of organization and the amount of capital used per worker; and that in any given industry, the share varies from one year to another with changes in business conditions.

But these conclusions, interesting as they are, raise more questions than they answer. (1) If we take only the highly organized, large-scale industries, in which the net proceeds are most definitely allocated to wages, interest, rent and profits, what share do we find going to hired labor? (2) What part of the total payroll goes to high-salaried officials, and what part to the manual workers and clerical staff? (3) What is the average *per capita* compensation of employees in the different industries and how closely has this compensation followed changes in the cost of living? (4) How important is the addition to their main incomes,

which wage-earners and salaried men get from other sources? Tables 18, 19, 20 and 21 show what light our data throw upon these problems.

The highly organized industries in our list that employ much labor and present satisfactory data for analysis include mining, large-scale manufacturing, and the several branches of land transportation. Roughly speaking, these industries produce a third of the National Income. It is feasible to divide their net value products into two parts, compensation for hired labor, and compensation for management and the use of property. Needless to say, management involves work, and even in these highly organized industries, this work is paid for in part by profits. It should also be noted that the available data come from "going concerns". Losses which such concerns suffer presumably are deducted from profits. But the losses of enterprises that go into bankruptcy or "fail to succeed" in any year are not likely to be reported in our sources, and such losses fall mainly, though not exclusively, upon "management and property". We do not know how large such losses are, but they probably make an appreciable offset to the income received by active business men and investors.

Even with these qualifications, the figures in

Table 18 are highly significant. The share of the net value product paid in wages, salaries, pensions and the like varies from two-thirds to a little more than three-quarters. Conversely "management and property" receive from a third to less than a quarter of the net proceeds. These variations in the respective shares are due mainly to changes in business conditions, and during the war were probably more violent than usual. Both the high percentage that went to "management and property" in 1916 and the high percentage that went to hired labor in 1918 might prove to be outside the usual limits of fluctuation if we had data of this sort for a long series of "normal" years.

TABLE 18

DIVISION OF COMBINED NET VALUE PRODUCT OF MINES, FACTORIES, AND LAND TRANSPORTATION BETWEEN EARNINGS OF EMPLOYEES AND RETURNS FOR MANAGEMENT AND THE USE OF PROPERTY

1909-1918

Note:—"Wages and salaries" includes all pensions, compensation for accidents, and the like. "Management and property" includes rentals, royalties, interest, and dividends. "Net value product" does not include raw materials, supplies, and services received from other industries.

| Year | Millions of Dollars | | Per Cent. | |
|---|---|---|---|---|
| | Wages and Salaries | Management and Property | Wages and Salaries | Management and Property |
| 1909 | $6,481 | $2,950 | 68.7 | 31.3 |
| 1910 | 7,156 | 3,250 | 68.8 | 31.2 |
| 1911 | 7,287 | 2,791 | 72.3 | 27.7 |
| 1912 | 7,993 | 3,169 | 71.6 | 28.4 |
| 1913 | 8,651 | 3,359 | 72.0 | 28.0 |
| 1914 | 7,947 | 2,816 | 73.8 | 26.2 |
| 1915 | 8,722 | 3,470 | 71.5 | 28.5 |
| 1916 | 11,630 | 5,810 | 66.7 | 33.3 |
| 1917 | 14,375 | 6,502 | 68.9 | 31.1 |
| 1918 | 17,472 | 5,124 | 77.3 | 22.7 |

The division of the total payments for hired labor between the salaries of officials and the vast army of manual and clerical workers can be effected very roughly for this same group of highly organized industries. Table 19 gives the best figures of this sort which Mr. King has been able to compile. The results confirm and make more precise two generally accepted opinions, (1) that the salaries of officials do not bulk large in the total payroll, and (2) that salaries are distinctly more stable than wages. The indications are that in highly organized enterprises, salaries absorb not much more than 7 or 8 per cent. of the payroll, and not more than 5 or 6 per cent. of the net value product. In prosperous times, they increase less rapidly than wages, but fall little if at all in hard times. Indeed, if our data are representative, salaries actually increased somewhat in the face of the depression of 1914. The net increase from 1909 to 1918 was 145 per cent. in salaries of officials as against 172 per cent. in wages of manual and clerical employees.

Concerning the average annual earnings of wage and salary earners and the fluctuations in the purchasing power of their incomes, Mr. King has been able to collect data which cover substantially the whole field of industry, though not in

TABLE 19

## A ROUGH COMPARISON OF THE SALARIES OF OFFICIALS, THE PAY OF MANUAL AND CLERICAL EMPLOYEES, AND THE NET VALUE PRODUCT, OF MINES, FACTORIES, AND LAND TRANSPORTATION

1909-1918

NOTE:—"Wages and Salaries" include pensions, compensation for accidents, and the like. The net value product does not include raw materials, supplies, or services received from other industries.

| Year | Total Net Value Product of the Given Industries | Total Wages and Salaries | Salaries of Officials | Pay of Manual and Clerical Employees | Percentage of Net Value Product Paid as | | | Percentage of Total Wages and Salaries Paid as | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total Wages and Salaries | Salaries of Officials | Pay of Manual and Clerical Employees | Salaries of Officials | Pay of Manual and Clerical Employees |
| | Millions of Dollars | | | | | | | | |
| 1909 | $ 9,568 | $ 6,521 | $ 504 | $ 6,017 | 68.2 | 5.3 | 62.9 | 7.7 | 92.3 |
| 1910 | 10,505 | 7,164 | 541 | 6,623 | 68.2 | 5.2 | 63.0 | 7.6 | 92.4 |
| 1911 | 10,186 | 7,290 | 578 | 6,712 | 71.6 | 5.7 | 65.9 | 7.9 | 92.1 |
| 1912 | 11,296 | 7,979 | 617 | 7,362 | 70.7 | 5.5 | 65.2 | 7.7 | 92.3 |
| 1913 | 12,244 | 8,754 | 656 | 8,098 | 71.5 | 5.4 | 66.1 | 7.5 | 92.5 |
| 1914 | 10,937 | 8,009 | 691 | 7,318 | 73.2 | 6.3 | 66.9 | 8.6 | 91.4 |
| 1915 | 12,162 | 8,556 | 723 | 7,833 | 70.3 | 5.9 | 64.4 | 8.5 | 91.5 |
| 1916 | 17,593 | 11,599 | 846 | 10,753 | 65.9 | 4.8 | 61.1 | 7.3 | 92.7 |
| 1917 | 20,928 | 14,441 | 1,015 | 13,426 | 69.0 | 4.9 | 64.1 | 7.0 | 93.0 |
| 1918 | 22,757 | 17,471 | 1,235 | 16,236 | 76.8 | 5.4 | 71.4 | 7.1 | 92.9 |

sufficient detail to permit of refined analysis. His results are summarized in Table 20.

The top section of this table shows the average money earnings each year of all employees who normally make their living by working in the specified industries. Since the people "attached to an industry" are never all at work, average earnings are somewhat lower than would be the earnings of an employee of average ability, who was able to work full-time throughout the year. Average actual earnings are affected not only by "unemployment" in the usual sense of that term, but also by loss of time through sickness, voluntary periods of rest, and seasonal shiftings from one kind of work to another. In agriculture, particularly, the average employee has a short working season so that yearly earnings of most "farm hands" are meager even when they are getting good wages by the day or month. The figures in the table do not show changes in wage rates or in "the price of labor", but something more significant—namely, the average earnings that the employees in different industries have realized each year under the conditions of pay, employment, and health that actually obtained.

More significant still is the middle section of the table in which the purchasing power of money

earnings is expressed in terms of 1913 prices. These figures were made by applying the Bureau of Labor Statistics index number of "the cost of living" on the 1913 base, to the money earnings of each year. According to these figures, the economic condition of the average employee improved in all the industries covered from 1909 to 1913, though the improvement was slight in the hand trades, water transportation, agriculture, and the "unclassified industries". The grand average shows a gain of 10.6 per cent. in purchasing power in these four years. From 1913 to 1918, on the contrary, the grand average undergoes wide fluctuations, caused by the violent changes in wage rates and living expenses, the net effect of which was a decline of about 5 per cent. of the purchasing power enjoyed in 1913. This decline, however, was confined to four industries—government, whose enlistment of millions of soldiers brought down the average compensation sharply in 1918; public utilities which suffered to a peculiar degree from inability to raise their selling prices and which largely increased the proportion of their female employees; the unclassified industries; and banking, in which salaries did not advance so steadily as the cost of living. On the other hand, notable gains were scored by em-

ployees of mines, factories, railways, and water-transportation companies. All these fluctuations are reduced to a comparable base by the "indices of the purchasing power of annual earnings" in the third section of the table.

TABLE

THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES

1909-

| Denominator of Earnings | Calendar Year | All Industries [1] | Agriculture [2] | Production of Minerals [2] | Manufacturing Factories [2] | Manufacturing Hand Trades [2] |
|---|---|---|---|---|---|---|
| Current Money | 1909 | $626 | $302 | $599 | $571 | $699 |
| | 1910 | 656 | 301 | 642 | 620 | 681 |
| | 1911 | 648 | 317 | 647 | 609 | 657 |
| | 1912 | 692 | 319 | 687 | 655 | 714 |
| | 1913 | 723 | 328 | 755 | 705 | 748 |
| | 1914 | 674 | 321 | 649 | 616 | 640 |
| | 1915 | 697 | 330 | 656 | 658 | 693 |
| | 1916 | 831 | 357 | 814 | 873 | 840 |
| | 1917 | 961 | 468 | 1,025 | 1,022 | 945 |
| | 1918 | 1,078 | 590 | 1,283 | 1,148 | 1,194 |
| Value at Prices of 1913 | 1909 | $656 | $316 | $627 | $597 | $732 |
| | 1910 | 671 | 308 | 656 | 634 | 696 |
| | 1911 | 659 | 322 | 658 | 619 | 667 |
| | 1912 | 696 | 321 | 691 | 659 | 719 |
| | 1913 | 723 | 328 | 755 | 705 | 748 |
| | 1914 | 668 | 317 | 643 | 610 | 634 |
| | 1915 | 677 | 320 | 637 | 634 | 673 |
| | 1916 | 755 | 325 | 740 | 794 | 763 |
| | 1917 | 745 | 359 | 795 | 792 | 732 |
| | 1918 | 682 | 373 | 812 | 726 | 756 |
| Indices of the Purchasing Power of Annual Earnings. Base, 1913 | 1909 | 90.7 | 96.3 | 83.0 | 84.7 | 97.9 |
| | 1910 | 92.8 | 93.9 | 86.9 | 89.9 | 93.0 |
| | 1911 | 91.1 | 98.2 | 87.1 | 87.8 | 89.2 |
| | 1912 | 96.3 | 97.9 | 91.5 | 93.5 | 96.1 |
| | 1913 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | 1914 | 92.4 | 96.6 | 85.2 | 86.5 | 84.8 |
| | 1915 | 93.6 | 97.6 | 84.4 | 89.9 | 90.0 |
| | 1916 | 104.4 | 99.1 | 98.0 | 112.6 | 102.0 |
| | 1917 | 103.0 | 109.5 | 105.3 | 112.3 | 97.9 |
| | 1918 | 94.3 | 113.7 | 107.5 | 103.0 | 101.1 |

[1] Includes amounts paid for pensions and compensation for injuries.
[2] Includes payments for work done by contract.
[3] Includes subsistence but excludes pensions.

Finally, how much income do employees receive from other sources than their wages, salaries, pensions and the like? Definite data on this head are scarce, though everyone knows that many wage and salary earners eke out their living by small

20

NORMALLY ENGAGED IN VARIOUS INDUSTRIES

1918

| All Transportation [1] | Transportation: Railway [1] Express, Pullman, Switching and Terminal Cos. | Transportation: Street Railway, [1] Electric Light and Power, Telegraph and Telephone Cos. | Transportation by Water [2] | Banking | Government [3] | Unclassified Industries |
|---|---|---|---|---|---|---|
| $657 | $651 | $623 | $773 | $770 | $739 | $716 |
| 688 | 690 | 638 | 788 | 797 | 763 | 743 |
| 697 | 705 | 641 | 773 | 843 | 778 | 715 |
| 731 | 747 | 652 | 808 | 887 | 798 | 772 |
| 762 | 782 | 678 | 825 | 930 | 823 | 779 |
| 721 | 723 | 683 | 807 | 921 | 842 | 768 |
| 727 | 728 | 666 | 880 | 1,017 | 861 | 777 |
| 842 | 849 | 732 | 1,081 | 1,170 | 891 | 867 |
| 1,017 | 1,063 | 790 | 1,306 | 1,238 | 940 | 972 |
| 1,286 | 1,394 | 878 | 1,590 | 1,461 | 895 | 1,054 |
| $688 | $682 | $653 | $810 | $807 | $774 | $750 |
| 703 | 705 | 658 | 806 | 815 | 780 | 759 |
| 709 | 716 | 652 | 785 | 857 | 791 | 727 |
| 736 | 751 | 656 | 813 | 892 | 803 | 777 |
| 762 | 782 | 678 | 825 | 930 | 823 | 779 |
| 714 | 716 | 676 | 799 | 912 | 833 | 760 |
| 706 | 707 | 647 | 854 | 987 | 836 | 755 |
| 765 | 772 | 665 | 983 | 1,064 | 810 | 788 |
| 789 | 824 | 613 | 1,012 | 959 | 729 | 753 |
| 814 | 882 | 556 | 1,006 | 925 | 567 | 667 |
| 90.3 | 87.2 | 96.3 | 98.2 | 86.8 | 94.0 | 96.3 |
| 92.3 | 90.2 | 96.3 | 97.7 | 87.6 | 94.8 | 97.4 |
| 93.0 | 91.6 | 96.2 | 95.2 | 92.2 | 96.1 | 93.3 |
| 96.6 | 96.0 | 96.8 | 98.5 | 95.9 | 97.6 | 99.7 |
| 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 93.7 | 91.6 | 99.7 | 96.8 | 98.1 | 101.2 | 97.6 |
| 92.7 | 90.4 | 95.4 | 103.5 | 106.1 | 101.6 | 96.9 |
| 100.4 | 98.7 | 98.1 | 119.2 | 114.4 | 98.4 | 101.2 |
| 103.5 | 105.4 | 90.4 | 122.7 | 103.1 | 88.6 | 96.7 |
| 106.8 | 112.8 | 82.0 | 121.9 | 99.5 | 68.9 | 85.6 |

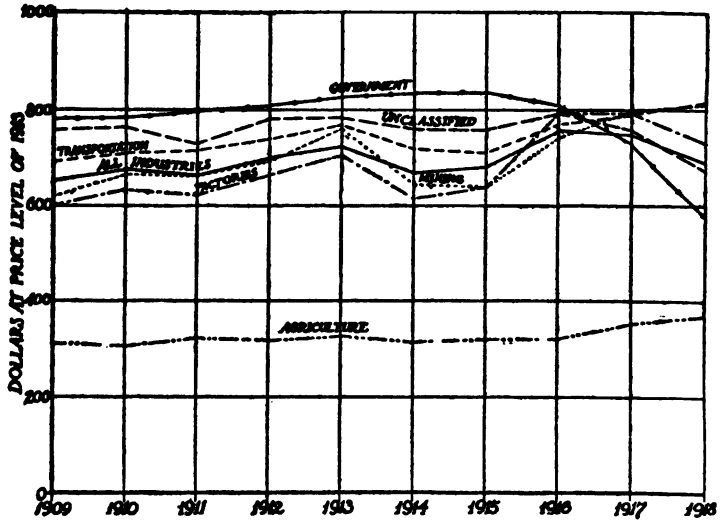
business ventures, taking boarders or lodgers, raising poultry, cultivating gardens, or keeping cows, and that many salaried men have substan-

CHART 22.

THE PURCHASING POWER AT THE PRICE LEVEL OF 1913 OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN VARIOUS INDUSTRIES.

1909-1918.

Based upon Table 20.




tial incomes from investments of one kind or another.

A study of 1602 school teachers, made by a Committee on Teachers' Salaries, indicated an income from investments of 6 per cent. of the total income. A similar study of 12,096 families by the

Bureau of Labor Statistics, showed from 4 to 5 per cent. of the total income as coming from investments, but these families were selected so as to exclude those having a large percentage from

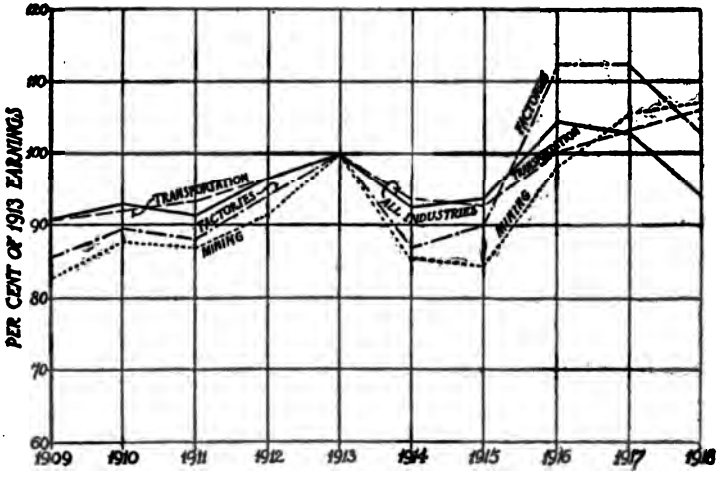
CHART 23.

RELATIVE FLUCTUATIONS IN THE PURCHASING POWER AT THE PRICE LEVEL OF 1913, OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN MINING, MANUFACTURING, TRANSPORTATION, AND ALL INDUSTRIES.

1909-1918.

Annual earnings in 1913 = 100.

Based upon Table 20.




these sources. Chapin's study indicated that the New York working class received about 6 per cent. of their total income from sources other than earnings. An investigation by the United States Public

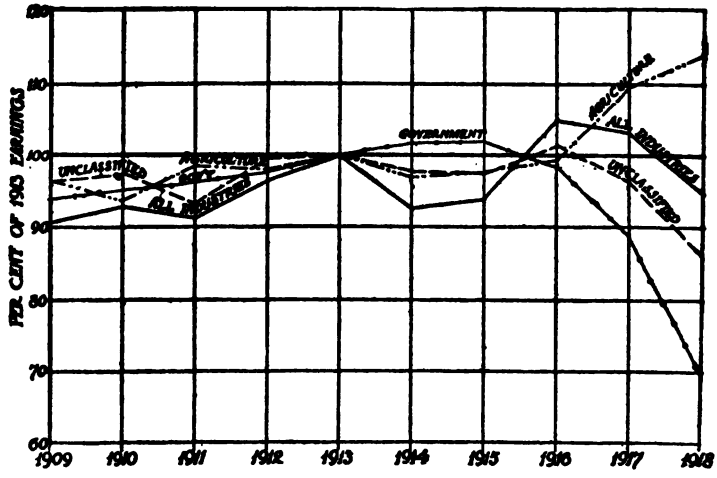
Health Service in South Carolina showed that in 1917 families of cotton mill workers derived about 12 per cent. of their income from miscellaneous sources. The higher percentage in South Caro-

CHART 24.

RELATIVE FLUCTUATIONS IN THE PURCHASING POWER AT THE PRICE LEVEL OF 1913, OF THE AVERAGE ANNUAL EARNINGS OF EMPLOYEES IN AGRICULTURE, GOVERNMENT, UNCLASSIFIED, AND ALL INDUSTRIES.

Annual earnings in 1913 = 100.

Based upon Table 20.




lina is probably due to the fact that these mill workers live for the most part in villages where it is easy to raise gardens and keep cows, while the New York employees have few such opportunities. If ordinary salaried em-

ployees are included with the wage earners, it appears likely that 8 per cent. is not too high an allowance for income from sources other than earnings. That the higher salaried classes receive a much larger proportion of their income from investments seems highly probable.

If an estimate is to be made, then, of the supplemental incomes of wage and salary earners, it is desirable to break this class up into at least three sections. The *Statistics of Income,* published by the Bureau of Internal Revenue, makes possible a division of this sort. Before 1916, however, no figures are available. Since the material is so fragmentary, it seems best to present only

TABLE 21

A ROUGH ESTIMATE FOR 1918 OF THE INCOME FROM ALL SOURCES OF SALARY AND WAGE WORKERS

| | Millions of Dollars | Per Cent. of Total National Pay Roll | Per Cent. of Total National Income |
|---|---|---|---|
| **Total Compensation for Services of Employees having Incomes of** | | | |
| Less than $5,000 | $30,472 | 93.6 | |
| $5,000 to $20,000 [4] | 1,378 | 4.2 | |
| Over $20,000 [4] | 725 | 2.2 | |
| All Classes | $32,575 | 100.0 | |
| **Total Income of Employees having Incomes of** | | | |
| Less than $5,000 [1] | $32,910 | | 54.5 |
| $5,000 to $20,000 [2] | 1,585 | | 2.6 |
| Over $20,000 [3] | 942 | | 1.6 |
| All Classes | $35,437 | | 58.7 |
| **Total Income of Non-Employees** | $24,929 | | 41.3 |
| **Total Income of the Entire Population** | $60,366 | | 100.0 |

[1] Estimated at 1.08 times the total earnings.
[2] Estimated at 1.15 times the total earnings.
[3] Estimated at 1.30 times the total earnings.
[4] *Statistics of Income,* 1918, p. 44.

the division among the different classes as it existed in 1918. The probabilities are that the division in the other years was somewhat similar if allowance is made for variations in the purchasing power of money.

This estimate of the incidental income of the employed classes is, of course, based upon an extremely limited foundation, but it is believed, nevertheless, that even the crude figures presented are accurate enough to show in a very rough way the general magnitude of the quantities involved. Employees probably received in 1918, some three billions of dollars in addition to their wages and salaries—a sum representing approximately a twentieth of the National Income.

## II. PERSONAL INCOMES ABOVE AND BELOW $2,000 PER YEAR

Since 1917, the income-tax law has required all single persons having incomes of over $1,000 a year and all married persons having, separately or jointly, incomes exceeding $2,000 a year to make returns to the Bureau of Internal Revenue. That provision of the law was responsible for two of the major sections of the Estimate by Incomes Received. One of these sections is based primar-

ily upon the income-tax data, supplemented by estimates of the amount of under-reporting and non-reporting of taxable incomes. The second section, dealing with incomes below the exemption limit, is made from census data concerning the number of persons following gainful occupations (after subtraction of the numbers included in the first section), and from estimates of the average incomes of persons in these occupations. Thus, the $2,000 line necessarily plays a prominent rôle in this estimate. And that division is a fortunate one, for the $2,000 line serves as well as any arbitrary line could to divide families enjoying at least modest comfort from families that can scarcely be called well-to-do. Hence Mr. Knauth has carried this line of division through those sections of the Estimate by Incomes Received, which do not of themselves break in two at $2,000 —the sections dealing with farmers and with tax-exempt income. Further, he has rearranged his data for 1913-1916, when the family exemption limit was $3,000, on the $2,000 basis, and extended that distinction back to 1910-1912, when there was no income tax.

In presenting the results of this work, corporate surplus is temporarily disregarded as an item of National Income. Reasons have already been

given for believing that, during the years of high income-tax rates at least, no great amount of this income has been "realized" by stockholders.[1] And no small part of these accumulated surpluses was probably lost in the readjustments of 1919 and the business depression of 1920-21 before the time came when they could be "realized" to advantage. If the method of treating this item adopted here introduces serious inaccuracy into the figures, it doubtless reduces the amount of income assigned to the over-$2,000 class much more than it reduces the amount in the lower class.

Drawing the $2,000 line through farmers' incomes is a particularly delicate task. Several studies of the distribution of farmers' incomes have been made by experts in this field, so that Mr. Knauth has a statistical basis for his conclusions. But the statistical basis is narrow, and the application of ratios computed from a few hundred returns, no matter how carefully treated, to all the farmers in the country may involve an error that is considerable. Hence the general results of the inquiry will be presented for all incomes, for all except farmers' incomes, and for farmers' incomes by themselves.

One final warning: The following figures for

[1] See above, Chapter II, Section IV, pp. 43-45.

incomes over $2,000 are not made on the same basis as the income-tax returns and are not comparable with them. Not only does the Estimate by Incomes Received include income that evades the tax, but it also includes income that is not subject to taxation, the large items of their own produce consumed by farmers' families, the rental value of homes occupied by their owners, interest on tax-exempt bonds, and the minor item of salaries paid to state officials. In particular, the number of farmers legally subject to income tax is very much smaller than an incautious reader might infer from these figures.

Table 22 and the charts based upon it tell their own story. About the main facts of that story, there can be little doubt, though the details may be inaccurate. Certainly among the men, women and children gainfully employed in 1910, only a small fraction, perhaps as the table says one in twenty-five had an annual income exceeding $2,000. Certainly this ratio increased with the war-time rise of prices, perhaps it became one and a half persons out of every ten. Necessarily a much larger fraction of the total *income* than of income receivers belong above the $2,000 line—the table says a third of the income in 1910. Certainly, this fraction grew somewhat larger during the war, not

merely because events pushed millions of small incomes above the $2,000 line (a condition particularly characteristic of 1918 and 1919) but also because events for a time favored the increase in

TABLE 22

PERSONAL INCOMES ABOVE AND BELOW $2,000 PER ANNUM

1910-1919

ALL INCOME RECEIVERS

| Year | ACTUAL AMOUNTS | | | | RELATIVE AMOUNTS | | | |
|---|---|---|---|---|---|---|---|---|
| | No. of Persons | | Amount of Income | | No. of Persons | | Amount of Income | |
| | Income less than $2,000 | Income more than $2,000 | Income less than $2,000 | Income more than $2,000 | Income less than $2,000 | Income more than $2,000 | Income less than $2,000 | Income more than $2,000 |
| | Thousand persons | | Billion dollars | | Per cent. | | Per cent. | |
| 1910 | 34,352 | 1,411 | $20.0 | $9.9 | 96. | 4. | 67. | 33. |
| 1911 | 34,693 | 1,379 | 20.7 | 9.6 | 96. | 4. | 68. | 32. |
| 1912 | 34,969 | 1,411 | 21.6 | 9.9 | 96. | 4. | 69. | 31. |
| 1913 | 35,345 | 1,443 | 22.2 | 10.1 | 96. | 4. | 69. | 31. |
| 1914 | 35,752 | 1,444 | 22.2 | 9.8 | 96. | 4. | 69. | 31. |
| 1915 | 35,597 | 2,008 | 22.9 | 11.4 | 95. | 5. | 67. | 33. |
| 1916 | 35,366 | 2,748 | 26.0 | 15.6 | 93. | 7. | 62. | 38. |
| 1917 | 34,160 | 4,363 | 29.6 | 20.9 | 89. | 11. | 59. | 41. |
| 1918 | 35,021 | 5,291 | 36.8 | 23.2 | 87. | 13. | 61. | 39. |
| 1919 | 34,283 | 5,508 | 39.5 | 25.2 | 86. | 14. | 61. | 39. |
| | ALL INCOME RECEIVERS EXCEPT FARMERS | | | | | | | |
| 1910 | 28,100 | 1,300 | $16.3 | $9.6 | 96. | 4. | 63. | 37. |
| 1911 | 28,400 | 1,300 | 17.2 | 9.4 | 96. | 4. | 65. | 35. |
| 1912 | 28,700 | 1,300 | 17.9 | 9.6 | 96. | 4. | 65. | 35. |
| 1913 | 29,100 | 1,300 | 18.3 | 9.8 | 96. | 4. | 65. | 35. |
| 1914 | 29,500 | 1,300 | 18.3 | 9.5 | 96. | 4. | 66. | 34. |
| 1915 | 29,400 | 1,800 | 18.7 | 10.9 | 94. | 6. | 63. | 37. |
| 1916 | 29,400 | 2,300 | 21.4 | 14.4 | 93. | 7. | 60. | 40. |
| 1917 | 29,050 | 3,000 | 24.7 | 17.0 | 91. | 9. | 59. | 41. |
| 1918 | 30,450 | 3,400 | 32.1 | 17.4 | 90. | 10. | 64. | 36. |
| 1919 | 29,800 | 3,500 | 34.9 | 18.9 | 89. | 11. | 65. | 35. |
| | FARMERS | | | | | | | |
| 1910 | 6,252 | 111 | $3.7 | $ .3 | 98. | 2. | 93. | 7. |
| 1911 | 6,298 | 79 | 3.5 | .2 | 99. | 1. | 95. | 5. |
| 1912 | 6,269 | 111 | 3.7 | .3 | 98. | 2. | 93. | 7. |
| 1913 | 6,245 | 143 | 3.9 | .3 | 98. | 2. | 93. | 7. |
| 1914 | 6,252 | 144 | 3.9 | .3 | 98. | 2. | 93. | 7. |
| 1915 | 6,197 | 208 | 4.2 | .5 | 97. | 3. | 89. | 11. |
| 1916 | 5,966 | 448 | 4.6 | 1.2 | 93. | 7. | 79. | 21. |
| 1917 | 5,110 | 1,318 | 4.9 | 3.9 | 80. | 20. | 56. | 44. |
| 1918 | 4,571 | 1,861 | 4.7 | 5.8 | 71. | 29. | 45. | 55. |
| 1919 | 4,483 | 2,008 | 4.6 | 6.3 | 69. | 31. | 42. | 58. |

size of incomes already large (a condition particularly characteristic of 1916 and 1917).

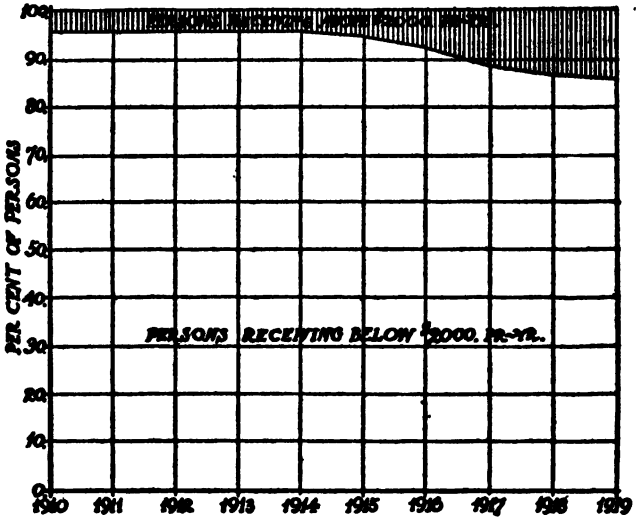
This use of a fixed sum of money in studying the distribution of income has its advantages; but

CHART 25.

PERCENTAGES OF PERSONS RECEIVING INCOMES ABOVE AND BELOW $2,000 PER ANNUM.

1910-1919.

Based upon Table 22.




it may be misleading if it stands alone. For, from the viewpoint of economic welfare, a fixed money income was a rapidly changing quantity during the war. The division of income receivers by the $2,000 line in 1919 is very far from meaning what that division meant in 1913. Some point between

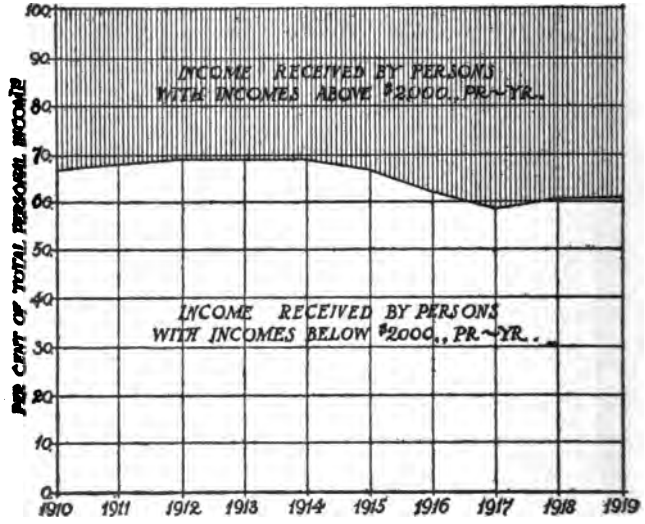
$3,000 and $4,000 a year in the later year would be needed to give results comparable in economic significance with the pre-war division at $2,000. But the data are not in such shape that we can

CHART 26.

PERCENTAGES OF TOTAL PERSONAL INCOME RECEIVED BY PERSONS WITH INCOMES ABOVE AND BELOW $2,000 PER ANNUM.

1910-1919.

Based upon Table 22.




draw dividing lines through the whole body of income receivers at any point we like in successive years.

Another approach to the problem, however, which supplements the preceding results in an

interesting way, is feasible. We can estimate in each year for which we have income-tax statistics —estimate very roughly—the amount of income received by the highest 5 per cent. of the persons having incomes. Studies made by the Internal Revenue Bureau show that the individuals included within any such group change much from year to year; but that fact is not disturbing. Nor is 5 per cent. of the income receivers a group limited to the wealthy; for, to include the highest 5 per cent. of all income receivers, we have to take in all incomes above $2,000 in 1913 and 1914, above $2,100 in 1915, above $2,600 in 1916, above $2,900 in 1917, above $3,300 in 1918, and above $3,400 in 1919. The conjectural element in the estimate arises from the difficulty of allocating non-taxable income among different income classes, of making proper allowances for under-reporting and non-reporting of incomes, and particularly of distributing the farmers along the income scale. This last difficulty is especially serious, so that we give the results in two forms, first including and then excluding the farmers.

What the results indicate is that about a third of the National Income went to the most prosperous twentieth of the income receivers in 1913 to 1916. But after 1916 the money incomes of this

class increased less rapidly than did those of the other nineteen-twentieths, so that the share of the total received by the most prosperous 5 per cent. dropped in 1919 to about a quarter of the total. From this point of view, also, the evidence indicates that the inequality in the distribution of income declined somewhat during the war.

TABLE 23

A CONJECTURAL ESTIMATE OF THE PERCENTAGE OF THE NATIONAL INCOME RECEIVED BY THE HIGHEST FIVE PER CENT. OF INCOME RECEIVERS

1913-1919

| Year | Income of the Highest 5% of Income Receivers (Billion Dollars) | Total Individual Income (excluding Corporate Surplus) (Billion Dollars) | Per Cent. of Total Income Received by Highest 5% of Income Receivers |
|---|---|---|---|
| **Including Farmers** | | | |
| 1913 | $10.6 | $32.3 | 33 |
| 1914 | 10.3 | 32.0 | 32 |
| 1915 | 11.1 | 34.3 | 32 |
| 1916 | 14.3 | 41.6 | 34 |
| 1917 | 14.7 | 50.5 | 29 |
| 1918 | 15.4 | 60.0 | 26 |
| 1919 | 15.5 | 64.7 | 24 |
| **Excluding Farmers** | | | |
| 1913 | $ 9.9 | $28.1 | 35 |
| 1914 | 9.6 | 27.8 | 34 |
| 1915 | 10.4 | 29.6 | 35 |
| 1916 | 12.8 | 35.8 | 36 |
| 1917 | 13.6 | 41.7 | 32 |
| 1918 | 13.9 | 49.5 | 28 |
| 1919 | 14.4 | 53.8 | 27 |

## III. THE DISTRIBUTION OF INCOME AMONG INDIVIDUALS

The standard method of showing how incomes are distributed among individuals is to use "fre-

quency tables." The following table, taken from the official *Statistics of Income* for 1918 is a good example of this device.

TABLE 24

THE DISTRIBUTION OF PERSONAL INCOMES BY INCOME CLASSES AS SHOWN BY THE OFFICIAL COMPILATION FOR THE CALENDAR YEAR 1918

| Income Classes | Number of Returns | Amount of Incomes (Millions of Dollars) | Percentage Number of Returns | Percentage Amount of Income |
|---|---|---|---|---|
| $ 1,000- $ 2,000 | 1,516,988 | $2,232 | 34.28 | 14.02 |
| 2,000- 3,000 | 1,495,878 | 3,627 | 33.83 | 22.78 |
| 3,000- 5,000 | 932,336 | 3,535 | 21.06 | 22.20 |
| 5,000- 10,000 | 319,356 | 2,146 | 7.22 | 13.47 |
| 10,000- 25,000 | 116,569 | 1,737 | 2.63 | 10.90 |
| 25,000- 50,000 | 28,542 | 978 | .65 | 6.14 |
| 50,000- 100,000 | 9,996 | 680 | .23 | 4.27 |
| 100,000- 150,000 | 2,858 | 284 | .05 | 1.78 |
| 150,000- 300,000 | 1,514 | 305 | .035 | 1.92 |
| 300,000- 500,000 | 382 | 145 | .009 | .91 |
| 500,000-1,000,000 | 178 | 119 | .004 | .75 |
| 1,000,000 and over | 67 | 137 | .002 | .86 |
| | 4,425,114 | $15,925 | 100.000 | 100.00 |

Such tables show certain features of the distribution of income admirably, but they do not give a clear picture of many peculiarities of the distribution as a whole. To show the facts all at once in their relations to each other it is desirable to use graphic methods.

But ordinary charts drawn on an arithmetic or *natural* scale do not serve the purpose. For example, if incomes be plotted along a horizontal line with one-tenth of an inch for each thousand dollars, the chart becomes unmanageably long—42 feet of paper are required to reach $5,000,000, and one income larger than that was reported in 1918.

Even that size is too small when the distribution of all incomes is to be presented; for below the $1,000 line differences of income at least as small as $100 per year become highly important. To make such intervals easily visible and keep the scale uniform so as not to distort the picture, over 400 feet of paper would be needed. Even more impractical demands for space are made by the vertical scale showing number of persons. Nor can the difficulty be met by breaking the problem into parts and drawing the several sections of the curve on different scales. For these sections with their dissimilar scales will not fuse into the single picture that is wanted. And taken singly no one of the sections can give an illuminating impression of the curve as a whole.

A more illuminating device than the natural-scale chart was used about 1896 by Vilfredo Pareto, when he plotted income-tax data on logarithmic paper, such as engineers use for many purposes. The logarithmic scale (which assigns equal spaces to each step in such a series as 100, 200, 400, 800, 1600, etc.) makes it possible to plot both the small and the large incomes and the small and large number of income receivers on a single sheet of paper and to do it in such a way

that the characteristic features of both ends of the curve may be observed.

Pareto, indeed, made large claims for the results attained by his use of the double logarithmic scale. He held that income-data distributions when plotted in this way give curves that closely approximate straight lines. Further, he held that income-tax figures from different countries and from different times, even data like house-rentals that presumably vary with incomes, all closely approximate straight lines having nearly uniform slopes. In the first flush of his enthusiasm he even implied that his investigations indicated the impossibility of altering substantially the proportions in which income is distributed among individuals—the type of this distribution in all countries at all stages of social development seemed to be immutable.

Charts 27 and 28 illustrate Pareto's device[1] and show roughly in what degree the American income-tax returns for 1913 to 1918 conform to his "straight-line law". Anyone accustomed to use only charts drawn on a natural scale may be inclined to say that the conformity is close. But

[1] Pareto charted "cumulative" data while we are charting non-cumulative data. However, it may be mathematically proven that if the cumulative distribution be a straight line on the double logarithmic scale, the non-cumulative distribution will also be a straight line on that scale.

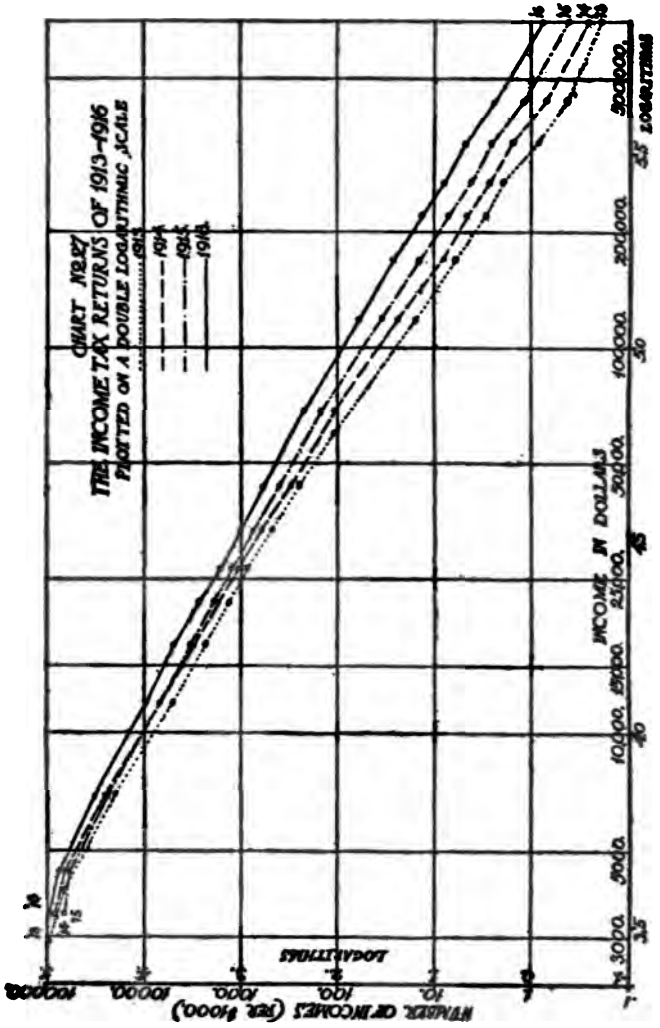
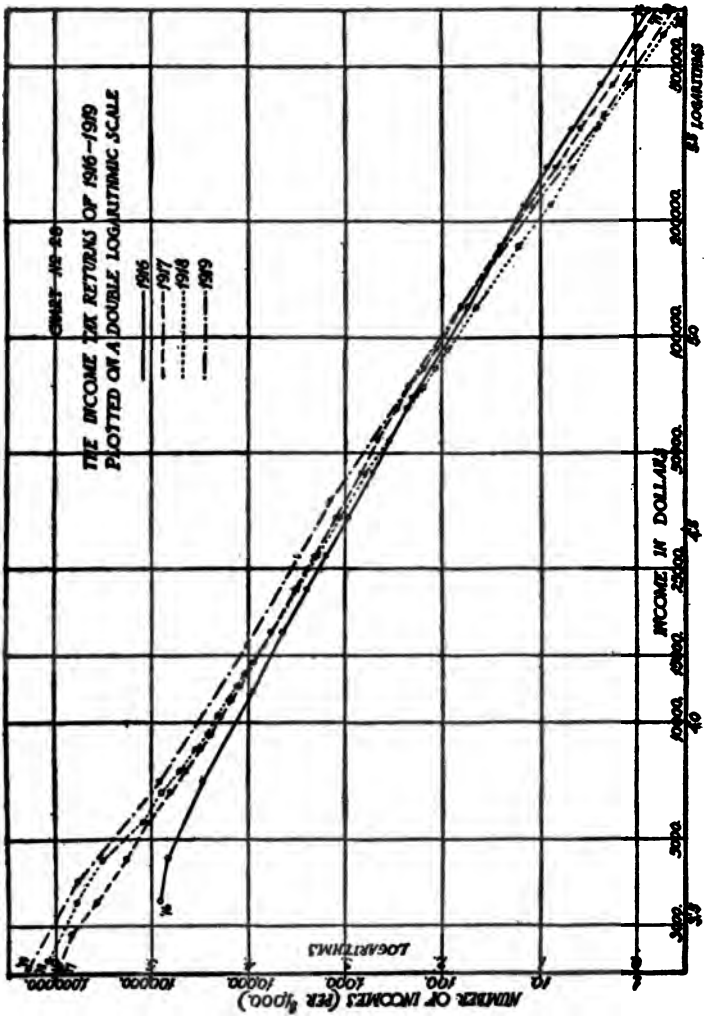


CHART No. 27
THE INCOME TAX RETURNS OF 1913-1916
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
1913
1914
1915
1916
NUMBER OF INCOMES (PER $1000.)
LOGARITHMS
INCOME IN DOLLARS
LOGARITHMS


THE INCOME TAX RETURNS OF 1916–1919
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
1916
1917
1918
1919
INCOME IN DOLLARS
NUMBER OF INCOMES (PER 1/1000)
LOGARITHMS
LOGARITHMS

the ratio treatment involved in the double logarithmic scale does so much compressing of the data, both for the incomes of large size and for the large numbers of income receivers, that in using it a very different standard of conformity should be set than is appropriate in interpreting natural-scale charts. And when one does look thus closely at the curves and especially when one actually tests their conformity to a straight line, one finds that the conformity is somewhat specious. (1) The lines are not straight. They show "bumps" and "hollows",—especially the most reliable of the set—that for 1918. Even if such surface irregularities be set aside as capable of being "smoothed out", the lines have slight but significant curvatures throughout their whole course. (2) The slope of the lines is not uniform. Nor can this lack of uniformity be attributed merely to the increase of population and the rise of prices, for such factors would simply shift the position of the curve as a whole without altering its form. Quite the contrary, the changes in slope suggest that changes in business conditions from one year to the next modified the distributions of income among people of large and of small means. In 1914-16 the slope grew less each year[1] with the

[1] The income tax figures for 1916 are not strictly comparable

increase of business activity and the enormous enhancement of profits. In 1916-18, on the contrary, the slope grew steeper again as the increase of wages and salaries raised the smaller incomes and encroached upon profits. In 1919 the slope grew less again.[1]

Another most serious defect of "Pareto's Law", as Professor Pareto himself saw, is that it cannot be extended to include incomes below the tax-exemption limit. The extension of the logarithmic straight line involves the absurdity of an infinite number of persons having incomes just above zero. We have excellent reason to believe on the contrary that at some income-interval below the tax-exemption limit, but well above zero, there is a maximum number of incomes, and that once past this interval the numbers of incomes in successive intervals decline indefinitely.

Considerations such as these have led Mr. Ma-

with those for the other years. In 1916 a husband and wife making separate returns were tabulated as one person.

The fact that the figures for 1913 report income for only ten months, while it lowers the log line, does not alter its slope.

[1] Professor A. L. Bowley, *Report from the Select Committee on Income Tax*, 1906, pp. 81 and 227, and Professor A. C. Pigou, *Economics of Welfare*, p. 695, have followed the lead of Pareto, *Cours d'économie politique*, p. 312, in curiously misinterpreting this matter of slope. The *steeper* the line (whether on a cumulative or non-cumulative basis), the less is the inequality of income. If all persons had the same income the distribution would be represented by a perpendicular line.

The slopes are all technically *negative* but the sense in which we have used the terms *greater* and *less* in the text is obvious.

caulay, who had charge of this part of the Bureau's investigation, to put aside "Pareto's Law" as having at the present time little more than historical interest. But he has kept the double logarithmic chart as a powerful instrument to be used in conjunction with other analytic devices in studying the nature of the distribution of incomes. His task was to construct a curve which would represent the best approximation to the facts of income-distribution that can be made by adjusting the available data in conformity with current statistical principles.

The materials which Mr. Macaulay had to use and the considerations which he had to keep in mind may be listed.

1. The income-tax data for 1918, the year for which the most complete returns were available, show the incomes of less than 3,000,000 out of more than 40,000,000 persons who had money incomes according to the census.[1] Further, these data had to be adjusted to include (1) the large number of persons, especially farmers and small business men, who failed to make any tax return whatever, (2) evasion by reporting persons, (3) non-monetary income, especially farm and garden

[1] The income-tax returns for the $1,000-$2,000 class are of but little use, because they do not include married people living together.

produce consumed by their producers and the rental value of homes occupied by their owners, (4) income from tax-exempt securities, etc. Mr. Knauth had estimated the magnitude of these factors; Mr. Macaulay had to distribute these amounts along the income curve in the most probable manner.

2. Mr. Knauth's division of the Estimate by Incomes Received into incomes of less and incomes of more than $2,000 was of help to Mr. Macaulay, though in the final adjustment of his curve to fit all the conditions that must be met he arrived at results slightly different from Mr. Knauth's on this point.

3. To distribute the incomes of less than $2,000 Mr. Macaulay had to combine the results of many scattered pieces of evidence. His largest and most important groups of material consisted of data showing the distribution of the wages of employees in manufacturing industries, in telephone and telegraph companies, in several branches of transportation and the salaries of federal employees in the civil service. He also used the small samples available showing the distribution of the incomes of farmers. The curve for each of these groups was based upon the available collections of data, weighting most heavily

those collections which seemed most valuable as indices of the distribution of the particular type of income under consideration. While some of these collections of data included hundreds of thousands of persons, the total number represented forms only a very small fraction of the millions of income receivers who had to be distributed, and only in the case of farmers and civil service employees did the data profess to show annual incomes. Further, it was necessary to add estimates of income from other sources to the income from wages, salaries, and farm profits which the data showed.

4. In every year many men in business lose money. The Estimates of the National Income by Sources of Production and by Incomes Received are made on a net basis, so far as possible. That is, negative income, so far as known, is deducted from positive income in computing the total. Mr. Macaulay had to estimate the number and aggregate amount of negative incomes before he could distribute the number and amount of positive incomes. For these estimates his materials were especially scanty.

5. Statistical experience in dealing with frequency curves representing vast bodies of data justified "smoothing" the curve. There is a

strong a priori probability that the income-curve has a single "mode" or apex, and that it has not many "bumps," or "rolls"[1] when charted on a double logarithmic scale. This a priori expectation is supported by the largest and best accredited collections of data that Mr. Macaulay found, such as the income tax figures, the great official investigations into wage rates, and (making allowance for the smallness of the sample) Mr. Arthur T. Emery's very careful investigation into the total incomes of 2,000 Chicago households. Such collections of data were also suggestive and enlightening as to many peculiarities which might be expected in the shape of the final income curve.

The final distribution, of which a part charted on the natural scale is shown by Chart 29 and a much larger part charted on a double logarithmic scale is shown by Chart 30, was built up by an elaborate series of adjustments to fit as well as might be all these considerations. The resulting curve is strictly empirical. It is fitted to adjusted data and is not a mathematical construction except through a very small part of its range. How ac-

[1] That is, the curve has not numerous "points of inflexion" when charted on a double logarithmic scale. The above statement and the statement concerning "smoothness" must not be interpreted as meaning that the income distribution is statistically homogeneous or can be adequately described by any mathematical equation suitable to describing distributions of homogeneous data.

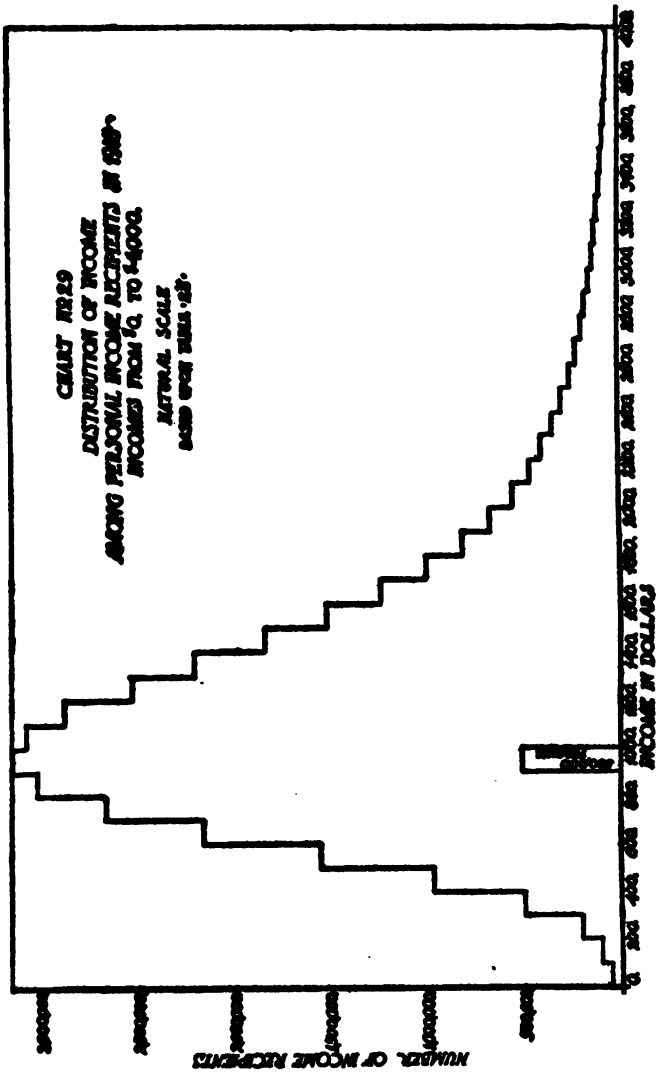


CHART NO. 29
DISTRIBUTION OF INCOME
AMONG PERSONAL INCOME RECIPIENTS IN 1918
INCOMES FROM $0 TO $4000
NATURAL SCALE
BASED UPON TABLE 23
INCOME IN DOLLARS
NUMBER OF INCOME RECIPIENTS

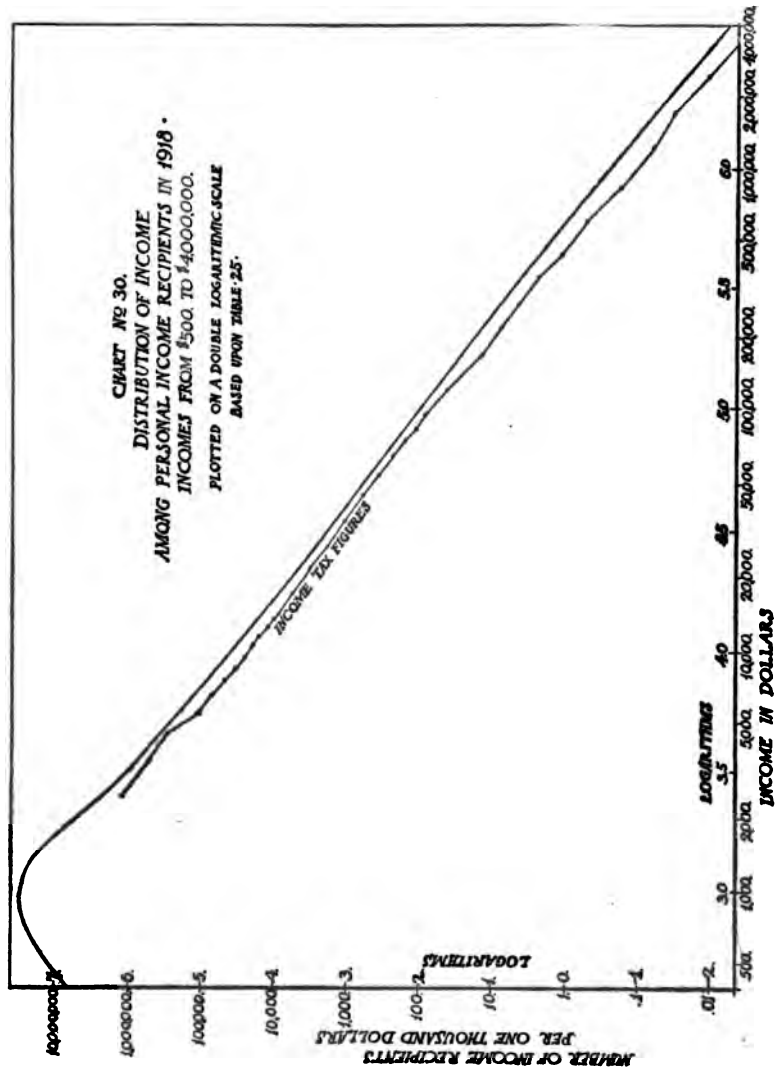


CHART No 30.
DISTRIBUTION OF INCOME
AMONG PERSONAL INCOME RECIPIENTS IN 1918 ·
INCOMES FROM $500. TO $4,000,000.
PLOTTED ON A DOUBLE LOGARITHMIC SCALE
BASED UPON TABLE 25.
INCOME TAX FIGURES
LOGARITHMS
INCOME IN DOLLARS
NUMBER OF INCOME RECIPIENTS
PER ONE THOUSAND DOLLARS
LOGARITHMS

curately it pictures the general character of the distribution of incomes in the United States cannot be told until an actual census of a large and well-selected sample of incomes be taken, and taken with careful attention to small increments of income in the lower ranges. But to the best of our belief this curve harmonizes with what may be learned about the distribution of income in the United States in 1918 by statistical analyses of data now available.[1]

The "bump" on the income tax curve in the $4,000 to $5,000 interval, as shown in Chart 28, was eliminated, because consultations with officers of the Internal Revenue Bureau and field collectors convinced Mr. Macaulay that this "bump" was caused by the "intensive drive" for incomes under $5,000 made that year.

The reason why the curve on a double logarithmic scale (see Chart 30) runs closest to the income tax data at about $50,000 is that while the percentage of illegal evasion is believed to decrease as incomes increase, the percentage of "legal evasion" and the percentage of tax-exempt income increases as incomes increase. At about $50,000 the resultant of these three influences is a minimum.

[1] The Australian war time census of incomes gives a different shaped curve from the one here presented. It is impossible to express the American data on the basis of the Australian curve.

An interesting side light on "Pareto's Law" may be had from a glance at the distribution of income from $0 to $4,000 per annum shown by Chart 29 on a natural scale. "Pareto's Law" is seen to be a statement concerning the shape of the mere "tail" of the distribution. Any examination of numerous statistical frequency distributions on a double logarithmic scale will quickly convince the investigator that many distributions of very different types have "tails" as much like one another as the tails of the income tax data for different years.

Table 25 shows the results of this investigation in figures. The summary at the end of the table calls attention to a leading peculiarity of the distribution of incomes during the war. Of the very large numbers of soldiers, sailors and marines then in government service, some thousands doubtless are represented in the income-tax returns. But the vast majority had little if any income that year beyond the pay, food, and clothing provided by the government. Mr. Macaulay has estimated that about 2,500,000 men were in this position in 1918, all receiving an income, the money value of which was substantially the same —about $700 per year. To chart all these soldiers, sailors and marines at the same point of the in-

TABLE 25

## DISTRIBUTION OF INCOME AMONG PERSONAL INCOME RECIPIENTS IN 1918

**The numbers below are given to the nearest unit. It is not pretended that such arithmetic accuracy is anything more than technical.**

| | | | |
|---|---|---|---|
| Arithmetic average .. | $1543[1] / 1490[2] | Lower quartile | $ 833[1] |
| | | Median | 1140[1] |
| Mode | $ 957[1] | Upper quartile | $1574[1] |

| Income Class | | | Number of Persons | Total Income |
|---|---|---|---|---|
| Under Zero[3] | | | 200,000 | $ — 125,000,000 |
| $ 0 | to | $ 100 | 62,809 | 3,368,863 |
| 100 | to | 200 | 103,704 | 16,047,939 |
| 200 | to | 300 | 209,087 | 53,701,566 |
| 300 | to | 400 | 489,963 | 174,747,705 |
| 400 | to | 500 | 961,991 | 437,421,733 |
| 500 | to | 600 | 1,549,974 | 857,666,411 |
| 600 | to | 700 | 2,154,474 | 1,405,213,223 |
| 700 | to | 800 | 2,668,466 | 2,005,009,301 |
| 800 | to | 900 | 3,013,034 | 2,563,100,947 |
| 900 | to | 1,000 | 3,144,722 | 2,987,688,735 |
| 1,000 | to | 1,100 | 3,074,351 | 3,226,729,363 |
| 1,100 | to | 1,200 | 2,850,526 | 3,275,784,572 |
| 1,200 | to | 1,300 | 2,535,285 | 3,166,235,800 |
| 1,300 | to | 1,400 | 2,205,728 | 2,973,220,322 |
| 1,400 | to | 1,500 | 1,832,230 | 2,653,820,477 |
| 1,500 | to | 1,600 | 1,512,649 | 2,342,101,155 |
| 1,600 | to | 1,700 | 1,234,397 | 2,034,621,765 |
| 1,700 | to | 1,800 | 999,996 | 1,748,225,207 |
| 1,800 | to | 1,900 | 811,236 | 1,499,396,953 |
| 1,900 | to | 2,000 | 663,789 | 1,293,303,255 |
| 2,000 | to | 2,100 | 549,787 | 1,126,240,869 |
| 2,100 | to | 2,200 | 463,222 | 995,402,469 |
| 2,200 | to | 2,300 | 395,115 | 888,501,304 |
| 2,300 | to | 2,400 | 340,141 | 798,920,154 |
| 2,400 | to | 2,500 | 295,490 | 723,614,676 |
| 2,500 | to | 2,600 | 258,650 | 659,277,149 |
| 2,600 | to | 2,700 | 227,731 | 603,250,834 |
| 2,700 | to | 2,800 | 201,488 | 553,889,766 |
| 2,800 | to | 2,900 | 178,901 | 509,693,726 |
| 2,900 | to | 3,000 | 154,499 | 455,622,047 |
| 3,000 | to | 3,100 | 142,802 | 435,416,064 |
| 3,100 | to | 3,200 | 128,217 | 403,770,475 |
| 3,200 | to | 3,300 | 115,583 | 375,547,256 |
| 3,300 | to | 3,400 | 104,504 | 350,001,254 |

[1] Excluding soldiers.
[2] Including soldiers.
[3] Negative incomes—i. e., net loss for year.

TABLE 25 (*Continued*)

| Income Class | Number of Persons | Total Income |
|---|---|---|
| $ 3,400 to $ 3,500 | 94,803 | $ 326,995,740 |
| 3,500 to 3,600 | 86,405 | 306,672,255 |
| 3,600 to 3,700 | 79,023 | 288,376,342 |
| 3,700 to 3,800 | 72,562 | 272,057,360 |
| 3,800 to 3,900 | 66,900 | 257,520,712 |
| 3,900 to 4,000 | 61,894 | 244,442,121 |
| 4,000 to 5,000 | 430,474 | 1,913,291,198 |
| 5,000 to 6,000 | 234,721 | 1,280,426,762 |
| 6,000 to 7,000 | 143,330 | 926,352,841 |
| 7,000 to 8,000 | 94,927 | 708,947,016 |
| 8,000 to 9,000 | 66,511 | 563,480,394 |
| 9,000 to 10,000 | 48,335 | 457,976,300 |
| 10,000 to 11,000 | 36,432 | 381,732,274 |
| 11,000 to 12,000 | 28,306 | 324,954,833 |
| 12,000 to 13,000 | 22,473 | 280,498,570 |
| 13,000 to 14,000 | 18,174 | 245,042,041 |
| 14,000 to 15,000 | 14,951 | 216,555,666 |
| 15,000 to 20,000 | 46,869 | 805,775,269 |
| 20,000 to 25,000 | 24,857 | 553,731,410 |
| 25,000 to 30,000 | 15,205 | 415,329,030 |
| 30,000 to 40,000 | 17,063 | 589,416,333 |
| 40,000 to 50,000 | 8,851 | 394,040,324 |
| 50,000 to 60,000 | 5,220 | 285,043,633 |
| 60,000 to 70,000 | 3,389 | 219,188,048 |
| 70,000 to 80,000 | 2,361 | 176,418,311 |
| 80,000 to 90,000 | 1,730 | 146,629,939 |
| 90,000 to 100,000 | 1,311 | 124,249,645 |
| 100,000 to 150,000 | 3,494 | 421,980,443 |
| 150,000 to 200,000 | 1,451 | 249,585,378 |
| 200,000 to 250,000 | 771 | 171,676,103 |
| 250,000 to 300,000 | 460 | 125,604,380 |
| 300,000 to 400,000 | 497 | 170,757,868 |
| 400,000 to 500,000 | 248 | 101,980,849 |
| 500,000 to 750,000 | 265 | 139,293,673 |
| 750,000 to 1,000,000 | 104 | 80,826,726 |
| 1,000,000 to 1,500,000 | 79 | 94,956,294 |
| 1,500,000 to 2,000,000 | 30 | 51,697,546 |
| 2,000,000 to 3,000,000 | 24 | 57,818,419 |
| 3,000,000 to 4,000,000 | 9 | 30,846,960 |
| 4,000,000 and over | 10 | 81,000,000 |
| Total | 37,569,060 | $57,954,722,341 |

TABLE 25 (*Continued*)

| Income Class | Number of Persons | Total Income |
|---|---|---|
| Under $2,000 | 32,278,411 | $34,592,405,292 |
| Over 2,000 | 5,290,649 | 23,362,317,049 |
| Total (excluding soldiers, sailors and marines[1]) | 37,569,060 | $57,954,722,341 |
| Soldiers, sailors and marines[1] | 2,500,000 | 1,750,000,000 |
| Grand Total | 40,069,060 | $59,704,722,341[2] |

[1] Of the total number of soldiers, sailors and marines, 2,500,000 are taken as having an average income of $700.

[2] To make this figure comparable with the estimates of Mr. King and Mr. Knauth, it is necessary to add $1,700,000,000 (Mr. Knauth's estimate) for corporate surplus. When this addition is made, the three totals are, in billions:

| | |
|---|---|
| Mr. King | $60.4 |
| Mr. Knauth | 61.7 |
| Mr. Macaulay | 61.4 |

TABLE 26

THE PERCENTAGE ANALYSIS OF THE DISTRIBUTION OF PERSONAL INCOMES IN 1918

(Excluding 2,500,000 soldiers, sailors and marines)

(Based upon Table 25)

| Income Class | Percentages of Total | | Cumulative Percentages | | | |
|---|---|---|---|---|---|---|
| | Number of Persons | Amount of Income | Over the Class Below | | Under the Class Above | |
| | | | Number of Persons | Amount of Income | Number of Persons | Amount of Income |
| Under Zero | .53 | —.22 | 100.00 | 100.00 | .53 | —.22 |
| $ 0 to $ 100 | .17 | .01 | 99.47 | 100.22 | .70 | —.21 |
| 100 to 200 | .28 | .03 | 99.30 | 100.21 | .98 | —.18 |
| 200 to 300 | .56 | .09 | 99.02 | 100.18 | 1.54 | —.09 |
| 300 to 400 | 1.30 | .30 | 98.46 | 100.09 | 2.84 | .21 |
| 400 to 500 | 2.56 | .75 | 97.16 | 99.79 | 5.40 | .96 |
| 500 to 600 | 4.12 | 1.48 | 94.60 | 99.04 | 9.52 | 2.44 |
| 600 to 700 | 5.73 | 2.43 | 90.48 | 97.56 | 15.25 | 4.87 |
| 700 to 800 | 7.10 | 3.46 | 84.75 | 95.13 | 22.35 | 8.33 |
| 800 to 900 | 8.02 | 4.42 | 77.65 | 91.67 | 30.37 | 12.75 |
| 900 to 1,000 | 8.37 | 5.16 | 69.63 | 87.25 | 38.74 | 17.91 |
| 1,000 to 1,100 | 8.18 | 5.57 | 61.26 | 82.09 | 46.92 | 23.48 |
| 1,100 to 1,200 | 7.59 | 5.65 | 53.08 | 76.52 | 54.51 | 29.13 |
| 1,200 to 1,300 | 6.75 | 5.46 | 45.49 | 70.87 | 61.26 | 34.59 |
| 1,300 to 1,400 | 5.87 | 5.13 | 38.74 | 65.41 | 67.13 | 39.72 |
| 1,400 to 1,500 | 4.88 | 4.58 | 32.87 | 60.28 | 72.01 | 44.30 |
| 1,500 to 1,600 | 4.03 | 4.04 | 27.99 | 55.70 | 76.04 | 48.34 |
| 1,600 to 1,700 | 3.29 | 3.51 | 23.96 | 51.66 | 79.33 | 51.85 |
| 1,700 to 1,800 | 2.66 | 3.02 | 20.67 | 48.15 | 81.99 | 54.87 |
| 1,800 to 1,900 | 2.16 | 2.59 | 18.01 | 45.13 | 84.15 | 57.46 |
| 1,900 to 2,000 | 1.77 | 2.23 | 15.85 | 42.54 | 85.92 | 59.69 |
| 2,000 to 2,100 | 1.46 | 1.94 | 14.08 | 40.31 | 87.38 | 61.63 |

TABLE 26 (*Continued*)

| Income Class | | Percentages of Total | | Cumulative Percentages | | | |
|---|---|---|---|---|---|---|---|
| | | Number of Persons | Amount of Income | Over the Class Below | | Under the Class Above | |
| | | | | Number of Persons | Amount of Income | Number of Persons | Amount of Income |
| $ 2,100 to | $ 2,200 | 1.22 | 1.72 | 12.62 | 38.37 | 88.61 | 63.35 |
| 2,200 to | 2,300 | 1.05 | 1.53 | 11.39 | 36.65 | 89.66 | 64.88 |
| 2,300 to | 2,400 | .90 | 1.38 | 10.34 | 35.12 | 90.56 | 66.26 |
| 2,400 to | 2,500 | .79 | 1.25 | 9.44 | 33.74 | 91.35 | 67.51 |
| 2,500 to | 2,600 | .69 | 1.14 | 8.65 | 32.49 | 92.04 | 68.65 |
| 2,600 to | 2,700 | .61 | 1.04 | 7.96 | 31.35 | 92.65 | 69.69 |
| 2,700 to | 2,800 | .54 | .96 | 7.35 | 30.31 | 93.19 | 70.65 |
| 2,800 to | 2,900 | .48 | .88 | 6.81 | 29.35 | 93.67 | 71.53 |
| 2,900 to | 3,000 | .41 | .79 | 6.33 | 28.47 | 94.08 | 72.32 |
| 3,000 to | 3,100 | .38 | .75 | 5.92 | 27.68 | 94.46 | 73.07 |
| 3,100 to | 3,200 | .34 | .70 | 5.54 | 26.93 | 94.80 | 73.77 |
| 3,200 to | 3,300 | .31 | .65 | 5.20 | 26.23 | 95.11 | 74.42 |
| 3,300 to | 3,400 | .28 | .60 | 4.89 | 25.58 | 95.39 | 75.02 |
| 3,400 to | 3,500 | .25 | .56 | 4.61 | 24.98 | 95.64 | 75.58 |
| 3,500 to | 3,600 | .23 | .53 | 4.36 | 24.42 | 95.87 | 76.11 |
| 3,600 to | 3,700 | .21 | .50 | 4.13 | 23.89 | 96.08 | 76.61 |
| 3,700 to | 3,800 | .19 | .47 | 3.92 | 23.39 | 96.27 | 77.08 |
| 3,800 to | 3,900 | .18 | .44 | 3.73 | 22.92 | 96.45 | 77.52 |
| 3,900 to | 4,000 | .16 | .42 | 3.55 | 22.48 | 96.61 | 77.94 |
| 4,000 to | 5,000 | 1.15 | 3.30 | 3.39 | 22.06 | 97.76 | 81.24 |
| 5,000 to | 6,000 | .62 | 2.21 | 2.24 | 18.76 | 98.38 | 83.45 |
| 6,000 to | 7,000 | .38 | 1.60 | 1.62 | 16.55 | 98.76 | 85.05 |
| 7,000 to | 8,000 | .25 | 1.22 | 1.24 | 14.95 | 99.01 | 86.27 |
| 8,000 to | 9,000 | .18 | .97 | .99 | 13.73 | 99.19 | 87.24 |
| 9,000 to | 10,000 | .13 | .79 | .81 | 12.76 | 99.32 | 88.03 |
| 10,000 to | 11,000 | .10 | .66 | .68 | 11.97 | 99.42 | 88.69 |
| 11,000 to | 12,000 | .075 | .56 | .58 | 11.31 | 99.495 | 89.25 |
| 12,000 to | 13,000 | .060 | .48 | .505 | 10.75 | 99.555 | 89.73 |
| 13,000 to | 14,000 | .048 | .42 | .445 | 10.27 | 99.603 | 90.15 |
| 14,000 to | 15,000 | .040 | .37 | .397 | 9.85 | 99.643 | 90.52 |
| 15,000 to | 20,000 | .125 | 1.39 | .357 | 9.48 | 99.768 | 91.91 |
| 20,000 to | 25,000 | .066 | .96 | .232 | 8.09 | 99.834 | 92.87 |
| 25,000 to | 30,000 | .040 | .72 | .166 | 7.13 | 99.874 | 93.59 |
| 30,000 to | 40,000 | .045 | 1.02 | .126 | 6.41 | 99.919 | 94.61 |
| 40,000 to | 50,000 | .024 | .68 | .081 | 5.39 | 99.943 | 95.29 |
| 50,000 to | 60,000 | .0139 | .49 | .057 | 4.71 | 99.9569 | 95.78 |
| 60,000 to | 70,000 | .0090 | .38 | .0431 | 4.22 | 99.9659 | 96.16 |
| 70,000 to | 80,000 | .0063 | .30 | .0341 | 3.84 | 99.9722 | 96.46 |
| 80,000 to | 90,000 | .0046 | .25 | .0278 | 3.54 | 99.9768 | 96.71 |
| 90,000 to | 100,000 | .0035 | .21 | .0232 | 3.29 | 99.9803 | 96.92 |
| 100,000 to | 150,000 | .0093 | .73 | .0197 | 3.08 | 99.9896 | 97.65 |
| 150,000 to | 200,000 | .0038 | .42 | .0104 | 2.35 | 99.9934 | 98.08 |
| 200,000 to | 250,000 | .0020 | .30 | .0066 | 1.92 | 99.9954 | 98.38 |
| 250,000 to | 300,000 | .00122 | .22 | .0046 | 1.62 | 99.99662 | 98.60 |
| 300,000 to | 400,000 | .00132 | .30 | .00338 | 1.40 | 99.99794 | 98.90 |
| 400,000 to | 500,000 | .00066 | .18 | .00206 | 1.10 | 99.99860 | 99.08 |
| 500,000 to | 750,000 | .00071 | .24 | .00140 | .92 | 99.99931 | 99.32 |
| 750,000 to | 1,000,000 | .00028 | .14 | .00069 | .68 | 99.99959 | 99.46 |
| 1,000,000 to | 1,500,000 | .00021 | .16 | .00041 | .54 | 99.99980 | 99.62 |
| 1,500,000 to | 2,000,000 | .00008 | .09 | .00020 | .38 | 99.99988 | 99.71 |
| 2,000,000 to | 3,000,000 | .00006 | .10 | .00012 | .29 | 99.99994 | 99.81 |
| 3,000,000 to | 4,000,000 | .00003 | .05 | .00006 | .19 | 99.99997 | 99.86 |
| 4,000,000 and over | | .00003 | .14 | .00003 | .14 | 100.00000 | 100.00 |
| Total..... | | 100.00000 | 100.00 | | | | |

TABLE 27

## A CONDENSED SUMMARY OF THE DISTRIBUTION OF PERSONAL INCOMES IN 1918
(Excluding 2,500,000 soldiers, sailors, and marines)

Based upon Table 25

| Income Class | Simple Distribution | | Cumulative Distribution | | | |
|---|---|---|---|---|---|---|
| | Number of Persons | Amount of Income | Over the Class Below | | Under the Class Above | |
| | | | Number of Persons | Amount of Income | Number of Persons | Amount of Income |
| Under Zero | 200,000 | $ —125,000,000 | 37,569,060 | $57,954,722,341 | 200,000 | $ —125,000,000 |
| $ 0-$ 500 | 1,827,554 | 685,287,806 | 37,369,060 | 58,079,722,341 | 2,027,554 | 560,287,806 |
| 500- 1,000 | 12,530,670 | 9,818,678,617 | 35,541,506 | 57,394,434,535 | 14,558,224 | 10,378,966,423 |
| 1,000- 1,500 | 12,498,120 | 15,295,790,534 | 23,010,836 | 47,575,755,918 | 27,056,344 | 25,674,756,957 |
| 1,500- 2,000 | 5,222,067 | 8,917,648,335 | 10,512,716 | 32,279,965,384 | 32,278,411 | 34,592,405,292 |
| 2,000- 3,000 | 3,065,024 | 7,314,412,994 | 5,290,649 | 23,362,317,049 | 35,343,435 | 41,906,818,286 |
| 3,000- 5,000 | 1,383,167 | 5,174,090,777 | 2,225,625 | 16,047,904,055 | 36,726,602 | 47,080,909,063 |
| 5,000- 10,000 | 587,824 | 3,937,183,313 | 842,458 | 10,873,813,278 | 37,314,426 | 51,018,092,376 |
| 10,000- 25,000 | 192,062 | 2,808,290,063 | 254,634 | 6,936,629,965 | 37,506,488 | 53,826,382,439 |
| 25,000- 50,000 | 41,119 | 1,398,785,687 | 62,572 | 4,128,339,902 | 37,547,607 | 55,225,168,126 |
| 50,000- 100,000 | 14,011 | 951,529,576 | 21,453 | 2,729,554,215 | 37,561,618 | 56,176,697,702 |
| 100,000- 200,000 | 4,945 | 671,565,821 | 7,442 | 1,778,024,639 | 37,566,563 | 56,848,263,523 |
| 200,000- 500,000 | 1,976 | 570,019,200 | 2,497 | 1,106,458,818 | 37,568,539 | 57,418,282,723 |
| 500,000-1,000,000 | 369 | 220,120,399 | 521 | 536,439,618 | 37,568,908 | 57,638,403,122 |
| 1,000,000 and over | 152 | 316,319,219 | 152 | 316,319,219 | 37,569,060 | 57,954,722,341 |
| Total | 37,569,060 | $57,954,722,341 | | | | |

TABLE 28

## THE PERCENTAGE ANALYSIS OF THE CONDENSED SUMMARY OF THE DISTRIBUTION OF INCOMES IN 1918

(Excluding 2,500,000 soldiers, sailors and marines)

Based upon Table 27

| Income Class | Simple Distribution (Percentages[1] of Total) | | Cumulative Distribution (Percentages of Total) | | | |
|---|---|---|---|---|---|---|
| | | | Over the Class Below | | Under the Class Above | |
| | Number of Persons | Amount of Income | Number of Persons | Amount of Income | Number of Persons | Amount of Income |
| Under Zero | .5324 | — .22 | 100.0000 | 100.00 | .5324 | — .22 |
| $ 0-$ 500 | 4.8645 | 1.18 | 99.4676 | 100.22 | 5.3969 | .96 |
| 500- 1,000 | 33.3537 | 16.94 | 94.6031 | 99.04 | 38.7506 | 17.90 |
| 1,000- 1,500 | 33.2670 | 26.40 | 61.2494 | 82.10 | 72.0176 | 44.30 |
| 1,500- 2,000 | 13.8999 | 15.39 | 27.9824 | 55.70 | 85.9175 | 59.69 |
| 2,000- 3,000 | 8.1584 | 12.62 | 14.0825 | 40.31 | 94.0759 | 72.31 |
| 3,000- 5,000 | 3.6817 | 8.93 | 5.9241 | 27.69 | 97.7576 | 81.24 |
| 5,000- 10,000 | 1.5646 | 6.79 | 2.2424 | 18.76 | 99.3222 | 88.03 |
| 10,000- 25,000 | .5112 | 4.85 | .6778 | 11.97 | 99.8334 | 92.88 |
| 25,000- 50,000 | .1094 | 2.41 | .1666 | 7.12 | 99.9428 | 95.29 |
| 50,000- 100,000 | .0373 | 1.64 | .0572 | 4.71 | 99.9801 | 96.93 |
| 100,000- 200,000 | .0132 | 1.16 | .0199 | 3.07 | 99.9933 | 98.09 |
| 200,000- 500,000 | .0053 | .98 | .0067 | 1.91 | 99.9986 | 99.07 |
| 500,000-1,000,000 | .0010 | .38 | .0014 | .93 | 99.9996 | 99.45 |
| 1,000,000 and over | .0004 | .55 | .0004 | .55 | 100.0000 | 100.00 |
| Total | 100.0000 | 100.00 | | | | |

[1] These percentages do not exactly tally with those which would be derived from Table 26. This discrepancy is due to dropping decimals.

come scale would be a fair representation of the income-distribution of 1918, but it would obviously make the curve most unrepresentative of ordinary years. In their civil occupations the men who fought in 1918 had doubtless been making incomes distributed over a wide range in much the same fashion that other individual incomes were distributed. Hence these soldiers, sailors and marines have been left out of the curve.

The figures in Table 25 and in the analytic and summary tables based upon it are subject to all the limitations set forth in describing how the curve from which the figures are derived was made. No one should take these figures as more than an indication of the type of income distribution which probably prevailed in the United States in 1918. These figures refer to a single year and Charts 27 and 28 have shown ground for believing that the slope of the income-curve and possibly other significant features are appreciably altered by changes in business conditions. Even if the curve which we are presenting were a thoroughly accredited representation of income distribution in 1918, we could not be sure that it would represent faithfully income distribution in 1921.

Two warnings must be repeated. (1) The data in this table profess to represent total income, in-

cluding important items not subject to taxation. They therefore are not comparable with the official tables published by the Internal Revenue Bureau. Part of the discrepancy, but not all of it, is due to our estimates of the under-reporting and non-reporting of incomes. (2) Taxes are not deducted from personal incomes in this table, though in so far as the table is based upon income-tax returns it may have been affected by the provision that in reporting to the federal authorities income-tax payers may deduct personal taxes and all taxes on property not used for business purposes, except special assessments to pay for improvements which benefit property.

How large an amount of the income which is represented goes to the federal government in income taxes may be judged from Table 29 which is taken from the official *Statistics of Income*. Of course, these official figures refer only to reported incomes. Percentage rates of tax drawn from this table therefore cannot be applied to our estimates of total income in the corresponding classes. The only possible adjustment would be to subtract the *total income tax* paid from the *total amount of income* shown in our table for all persons having incomes over $2,000.

TABLE 29

THE DISTRIBUTION OF NET PERSONAL INCOMES REPORTED TO THE BUREAU OF INTERNAL REVENUE IN 1917 AND 1918 BEFORE AND AFTER DEDUCTION OF FEDERAL INCOME TAXES

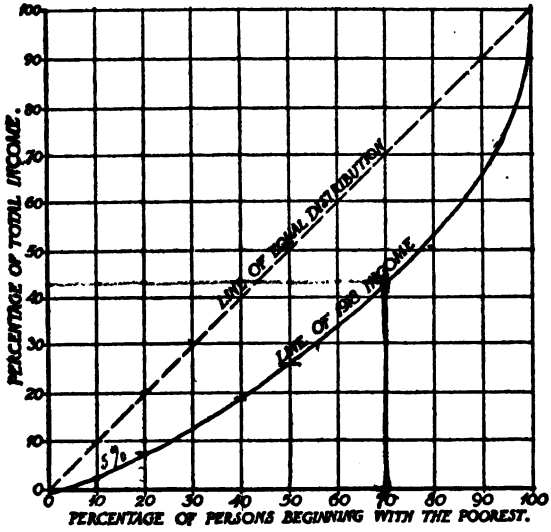
| Income Classes | Average Rate of Tax; Per Cent. | Average Tax per Individual | Average Income Before Deducting Tax | Average Income After Deducting Tax | Percentage of Total Reported Income Before Deducting Tax | Percentage of Total Reported Income After Deducting Tax |
|---|---|---|---|---|---|---|
| **1917** | | | | | | |
| $ 1,000-$ 2,000 | .66 | $ 10 | $ 1,500 | $ 1,490 | 18.04 | 18.86 |
| 2,000- 3,000 | .44 | 11 | 2,462 | 2,451 | 15.13 | 15.86 |
| 3,000- 5,000 | .86 | 33 | 3,773 | 3,740 | 15.50 | 16.19 |
| 5,000- 10,000 | 2.41 | 163 | 6,752 | 6,589 | 13.39 | 13.76 |
| 10,000- 25,000 | 4.78 | 717 | 14,997 | 14,279 | 12.36 | 12.40 |
| 25,000- 50,000 | 7.34 | 2,520 | 34,297 | 31,777 | 7.68 | 7.45 |
| 50,000- 100,000 | 10.04 | 6,836 | 68,084 | 61,248 | 6.20 | 5.88 |
| 100,000- 150,000 | 13.92 | 16,889 | 121,288 | 104,399 | 2.93 | 2.66 |
| 150,000- 300,000 | 18.27 | 36,949 | 202,238 | 165,289 | 3.48 | 2.99 |
| 300,000- 500,000 | 23.93 | 89,853 | 375,501 | 285,648 | 1.54 | 1.28 |
| 500,000-1,000,000 | 27.63 | 188,410 | 681,369 | 492,959 | 1.57 | 1.20 |
| 1,000,000 and over | 35.65 | 776,064 | 2,176,141 | 1,400,077 | 2.24 | 1.52 |
| **1918** | | | | | | |
| $ 1,000-$ 2,000 | 1.19 | $ 17 | $ 1,472 | $ 1,454 | 14.02 | 14.91 |
| 2,000- 3,000 | .98 | 24 | 2,423 | 2,399 | 23.76 | 24.27 |
| 3,000- 5,000 | 2.35 | 89 | 3,792 | 3,703 | 22.30 | 23.33 |
| 5,000- 10,000 | 4.34 | 291 | 6,719 | 6,427 | 13.47 | 13.87 |
| 10,000- 25,000 | 8.20 | 1,222 | 14,897 | 13,675 | 10.90 | 10.76 |
| 25,000- 50,000 | 13.32 | 4,568 | 34,267 | 29,704 | 6.14 | 5.73 |
| 50,000- 100,000 | 21.69 | 14,749 | 67,999 | 53,251 | 4.27 | 3.60 |
| 100,000- 150,000 | 33.68 | 40,577 | 120,486 | 79,910 | 1.78 | 1.27 |
| 150,000- 300,000 | 44.64 | 89,872 | 201,470 | 111,598 | 1.92 | 1.14 |
| 300,000- 500,000 | 54.77 | 207,238 | 378,391 | 171,153 | .91 | .44 |
| 500,000-1,000,000 | 58.65 | 392,327 | 668,964 | 276,637 | .75 | .33 |
| 1,000,000 and over | 64.65 | 1,326,646 | 2,052,043 | 725,398 | .86 | .33 |

To most minds, Charts 29 and 30 will probably give the clearest impression of the complex estimate set forth in our tables. But it is well to supplement these charts with a Lorenz curve representing the same set of figures. This device, used

CHART 31.

LORENZ CURVE SHOWING THE DISTRIBUTION OF INCOMES IN 1918.

Based upon the data presented in Table 26.




in Chart 31, shows graphically the deviation of the actual distribution of incomes from a perfectly even distribution. By looking at the two scales of this chart, the reader will see that if 10 per cent. of the income receivers got just 10 per cent. of the

total income, if 20 per cent. of them got just 20 per cent. of the total income, and so on, then the actual distribution would be represented by the straight diagonal line of the chart. From the "line of 1918 income" and the two scales, it is easy to see approximately what per cent. of the total income was obtained by any given percentage of the income receivers. For example, on the horizontal line, take the point marked "70 per cent."; follow the perpendicular line through this point to where it intersects the curve marked "Line of 1918 Income"; from this point of intersection, draw an imaginary horizontal line to the left until it intersects the left-hand perpendicular scale; it will be seen to intersect that scale at about "42½ per cent." This signifies, according to the chart, that the poorest 70 per cent. of income receivers had about 42½ per cent. of the National Income. Vice versa, the richest 30 per cent. had about 57½ per cent. of the National Income.

## CHAPTER 4

### CONCLUSIONS

1. The size of the National Income in the United States during recent years can be determined with a margin of error that is probably less than 10 per cent.

2. The final estimate of the National Income in 1909-1918 runs as follows:

| | (Billions) |
|---|---|
| 1909 | $28.8 |
| 1910 | 31.4 |
| 1911 | 31.2 |
| 1912 | 33.0 |
| 1913 | 34.4 |
| 1914 | 33.2 |
| 1915 | 36.0 |
| 1916 | 45.4 |
| 1917 | 53.9 |
| 1918 | 61.0 |

These figures do not include any allowance for the money value of the work done by housewives for their own families, an item which would add several billions to the money total if all housewives were paid on a commercial basis.

3. The final estimate of the National Income on a per capita basis is as follows:

| | |
|---|---|
| 1909 | $319 |
| 1910 | 340 |
| 1911 | 333 |
| 1912 | 346 |
| 1913 | 354 |
| 1914 | 335 |
| 1915 | 358 |
| 1916 | 446 |
| 1917 | 523 |
| 1918 | 586 |

4. Most of the huge increase in the National Income during the war was due merely to the rise of prices. If the preceding figures are reduced to terms of prices in 1913, we get the following results:

| | National Income (Billions) | Income per Capita |
|---|---|---|
| 1909 | $30.1 | $333 |
| 1910 | 32.2 | 349 |
| 1911 | 31.7 | 338 |
| 1912 | 33.2 | 348 |
| 1913 | 34.4 | 354 |
| 1914 | 33.0 | 333 |
| 1915 | 35.2 | 350 |
| 1916 | 40.7 | 400 |
| 1917 | 40.8 | 396 |
| 1918 | 38.8 | 372 |

5. Not only the National Income but also the Per Capita Income is much larger in the United States than in any other country. The following figures show the National and Per Capita Income at the outbreak of the war in countries for which estimates with a margin of error probably not exceeding 10 per cent. have been made.

| 1914 | National Income (Billions) | Income per Capita |
|---|---|---|
| United States | $33.2 | $335 |
| United Kingdom | 10.9 | 243 |
| Germany | 10.5 | 146 |
| Australia | 1.3 | 263 |

6. The share of the *net value product* of different industries which is paid to employees as compensation for their services (not by any means equivalent to the "share of labor" in industry) varies from about one-eighth of the total in agriculture to about three-quarters of the total in mining, manufacturing, water transportation and government work.

This share in most industries declined with the sudden rise of prices in 1914-16 and rose again with the advance of wages and salaries in 1917-18. The average for all industries was a trifle higher in 1918 than in 1909, but not so high as it had been in 1913.

7. In the highly organized industries conducted on a large scale, the pay of employees, including the salaries of officials, absorbs in most years some 69-72 per cent. of the net value product. The remaining 31-28 per cent. is the share of "management and capital." From it are paid interest, rent, and profits. Even in these highly organized industries, part of the work of management is paid for under the form of profits, and in some cases,

the subordinate officials and wage earners also share in the profits.

From 1909 to 1918, the extreme fluctuations in the share of management and profits varied from 33 per cent. of the net value product in 1916 to 23 per cent. in 1918.

8. Of the total payments to employees in the highly organized industries, about 92 per cent. goes to the manual workers and clerical staffs, while 8 per cent. goes to officials.

9. In 1918, the year for which the best data are available, about 86 per cent. of persons gainfully employed had incomes of less than $2,000 per annum, and about 14 per cent. had incomes exceeding that sum.

In the same year, about 60 per cent. of the National Income was divided among the 86 per cent. of the gainfully employed who had incomes less than $2,000 per annum, and about 40 per cent. of the National Income was divided among the 14 per cent. of the gainfully employed who had incomes exceeding $2,000.

The net effect of our participation in the war was to diminish somewhat (at least temporarily) the inequality in the distribution of American incomes.

10. If we consider the 5 per cent. of those

gainfully employed who had each year the largest incomes, we find that their share in the aggregate of personal incomes declined from about 33 per cent. in 1913-16 to about 25 per cent. in 1918-19.

11. Data regarding the detailed distribution of personal incomes are scanty and difficult to systematize; but the best approximation this Bureau has been able to make indicates that in 1918, the most prosperous one per cent. of the income receivers had nearly 14 per cent. of the total income, the most prosperous 5 per cent. of the income receivers had nearly 26 per cent. of the total, the most prosperous 10 per cent. of the income receivers had nearly 35 per cent. of the total, and the most prosperous 20 per cent. of the income receivers had about 47 per cent. of the total income.

It should be noted that when we start from the top of the income scale, we must go down to people receiving $8,000 per annum, in order to include one per cent. of the income receivers. Similarly, to include 5 per cent. of the income receivers, we have to descend to incomes of $3,200-$3,300. To include 10 per cent., we must take in part of the $2,300-$2,400 class; and to include 20 per cent. we must include part of the $1,700-$1,800 class.

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